ELECTRICAL SOUTH

Serving the 18 Southern and Southwestern States

How light replaces burglar alarms in a Little Rock, Ark., bank—pg. 18

FEBRUARY, 1955

HUNTER

Biggest seller of all window fans

HUNTER 2-SPEED
Electrically Reversible
WINDOW FAN

Sell extra value at competitive prices

- Cools several rooms at once
- Ventilates and circulates
- Certified air deliveries
- Whisper-quiet performance
- Patented safety grille
- Full 5-year guarantee

RETAIL PRICES

18" model.....$59.95 (2500 CFM)
22" model.....$79.95 (3400 CFM)

NATIONALLY ADVERTISED IN LEADING MAGAZINES!

Place your order early!

Contact your Hunter distributor, now . . . or write us for catalog.

Hunter

HUNTER FAN AND VENTILATING CO.
398 S. Front St., Memphis 2, Tenn.

Casement Window Model also available

Feature the Complete Hunter Line of Fans and Air Conditioners

WINDOW • HASSOCK • ATTIC • OSCILLATING • CEILING • EXHAUST • INDUSTRIAL

Installed in this modern, attractive interior by The McClure Electric Company were 48 2'x2' Beta units and 10 4'x4' Omega units. Both are completely self-contained units with Wakefield's exclusive Rigid-Arch plastic diffusers. Beta is for recessed mounting and Omega for on-surface mounting. Each comes in four sizes: 4'x4', 2'x4', 2'x2' and 1'x4'.

METROPOLITAN BUILDING AND LOAN ASSOCIATION, Dallas, Tex.

Electrical Contractor: McClure Electric Company, Dallas, Texas.

Licensed Agent: General Electric Supply Company, Dallas, Texas.

Contractor used Wakefield units to increase his sales on this job by $3200

It is poor business to try always to sell the cheapest. When you sell the best you make more money. And even more importantly you give your client a better result, one both he and you can be proud of.

In the case of this handsome installation of Wakefield Beta and Omega units, E. J. Whitlow, vice-president of The McClure Electric Company, Dallas, Texas, makes these enthusiastic yet logical comments:

"We are proud of this job. The reputation of Wakefield, the appearance of the fixtures and a little selling on our part all combined to increase our sales on this installation by about $3,200.

"Actually, very little sales effort on our part was necessary. Mr. Gus Berry, President of Metropolitan Building & Loan, has very nice taste. He was immediately sold on the appearance of the fixture and when we explained some of the advantages to him concerning ease of maintenance and some fine construction features he had no hesitancy in recommending to his Board of Directors that the difference be paid for Wakefield over the specified fixture.

"Your Mr. Dan Schisler was very helpful on this job. He went to great trouble to assist us. We congratulate you on your fine representative in this area."

New catalogs on Beta and Omega have recently been prepared. Other new catalogs cover the complete line of Wakefield Geometrics, the Wakefield Ceiling and luminaires of advanced design. Write to The F. W. Wakefield Brass Company, Vermilion, Ohio. In Canada: Wakefield Lighting Limited, London, Ontario.

Wakefield Over-ALL Lighting

ELECTRICAL SOUTH is published monthly at 214 West Morehead Street, Charlotte, North Carolina by W. R. C. Smith Publishing Company. Executive and Editorial Offices: 806 Peachtree Street, N. E., Atlanta 5, Georgia. Second-class mail privileges authorized at Charlotte, N. C. Subscription Rates: United States and Possessions, $1.00 per year; Canada and Foreign Countries, $10.00 per year.

Volume 35 **Number 2**

Southwire

PRODUCTS

ACSR CONDUCTORS

ALL ALUMINUM WIRE AND CABLE

BARE COPPER WIRE AND CABLE

NEOPRENE-COVERED COPPER WIRE

NEOPRENE-COVERED ALUMINUM WIRE

NEOPRENE-COVERED BUILDING WIRE

GALVANIZED STEEL STRAND

CABLE ACCESSORIES

COPPERWELD COMPOSITE CONDUCTOR

Utilities, REA's, contractors and wholesalers are finding out from first-hand experience that the name SOUTHWIRE means something to them — in terms of quality products and dependable service.

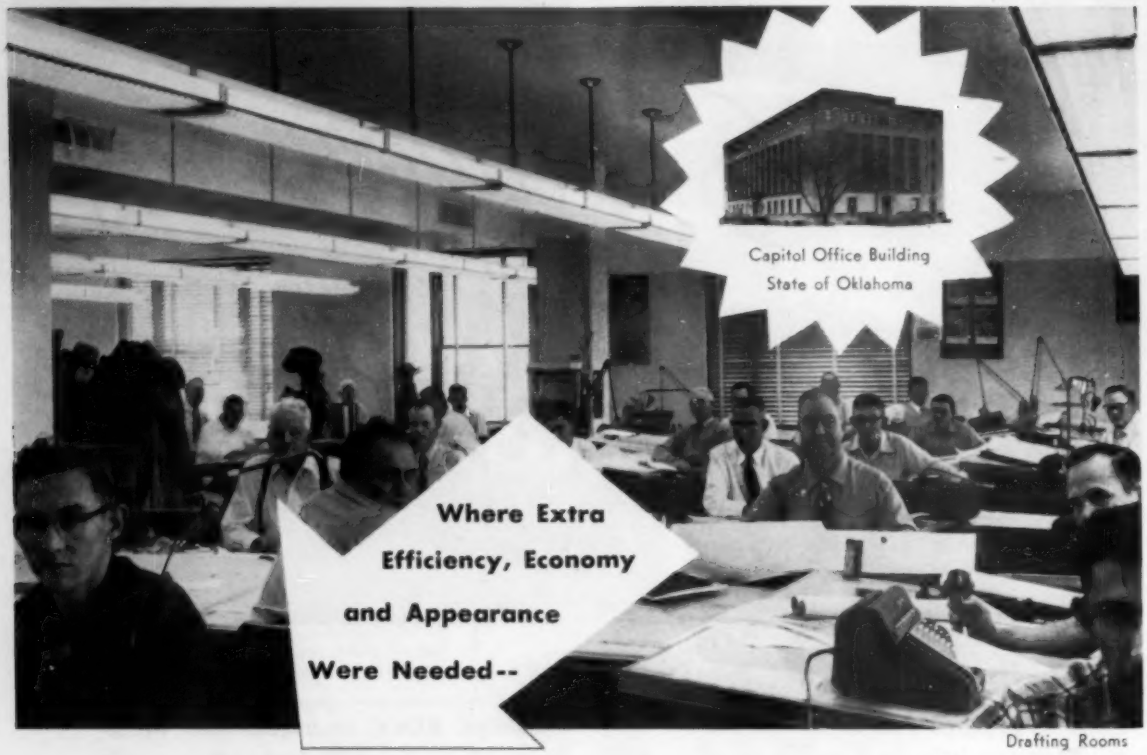
Now from one centrally-located Southern source you can obtain a complete variety of wire products and accessories for all your transmission and distribution needs.

Let us tell you about our facilities and service — show you how we are cutting costs for others and making deliveries that are often almost too good to be true!

Write, wire or telephone

Southwire Company

CARROLLTON, GEORGIA



Drafting Rooms

The Choice was L&P Fixtures!

For the drafting rooms in the State of Oklahoma Capitol Office Building in Oklahoma City, Mr. T. M. Richardson had to meet the very highest standards of efficiency—without sacrificing attractiveness or economy.

The Answer: L & P Lighting fixtures.

The Reason: L & P fixtures are designed, engineered, and manufactured—every step of the way—right in our own plant.

Distributed by Electrical Wholesalers Only—for catalog and prices, write today to:

LIGHT & POWER UTILITIES CORP.

LIGHT & POWER UTILITIES CORP. ***1035 Firestone Blvd., Memphis, Tenn.***

There's an L&P Representative Near You

For further information and prices on L & P fluorescent fixtures—standard or "custom-made"—check the following list, and phone or write the L & P representative nearest you.

N. B. Nichols
2509 Bishop
Little Rock, Ark.

Craig-Owen
736 Georgia Ave.
Chattanooga, Tenn.

C. V. Hammon
723 S. W. 29th St.
Oklahoma City, Okla.

John C. Fox
145 E. Milford Dr.
Syracuse, New York

E. A. Ishler
3737 East Main St.
Columbus 13, Ohio

C. K. Ramond
1021 Carondelet Bldg.
New Orleans, La.

Traweek-Healy & Assoc.
110 Cole
Dallas, Texas

Elmer Hydon
112 Inlone
Houston, Texas

T. B. Allen
3918 Beard Ave., So.
Minneapolis, Minn.

M. B. Mendenhall
4506 Country Club Blvd.
Sioux City, Iowa

J. Louis Weyhing
1914 Rutherford Ave.
Louisville, Ky.

R. O. Whitesell
2208 E. Washington Ave.
Indianapolis, Ind.

W. J. Milner
148 Walker S. W.
Atlanta, Ga.
(Also: St. Simons Island, Ga.)

John Irvin
Box 816
Nashville, Tenn.

N. W. Trowbridge
4632 Clemson Ave.
Columbia, S. C.

R. B. Baldwin
247 Bank St.
Norfolk, Va.

Light & Power Utilities Corp.
1035 Firestone Blvd.
Memphis, Tenn.

ELECTRICAL SOUTH

SERVING THE 18 SOUTHERN AND SOUTHWESTERN STATES

February, 1955 — Vol. 35—No. 2

CARL W. EVANS, *Editor*

VIRGIL S. PRICE, *Associate Editor*

FRANCES B. KELLY, *Assistant Editor*

BARON CREAGER, *Southwestern Editor*
(1305 National City Bldg., Dallas, Tex.)

T. W. McALLISTER, *Vice-Pres., Editorial Director*

FRANK P. BELL, *Business Manager*

J. J. FELTON, JR., *Asst. Business Manager*

J. A. MOODY, *Production Manager*

Editorial and Business Offices

Tel. Atwood 4462

806 Peachtree Street, N. E.,

Atlanta 5, Georgia

ANNUAL SUBSCRIPTION—$1.00
FOREIGN—$10.00

Business Representatives

New York:
GERARD TEASDALE, 78 Manhattan Ave., New York, N. Y. Tel. University 4-2087

Cleveland:
W. G. SHEEHAN, 17021 Amber Dr., Cleveland 11, Ohio. Tel. Winton 1-1806

Chicago:
ROBERT A. BLUM, 333 No. Michigan Ave., Chicago 1, Ill. Tel. Central 6-6064

Los Angeles:
L. B. CHAPPELL, 810 So. Robertson Blvd., Los Angeles 35, Calif. Tel. Crestview 4-5151

Charlotte:
W. C. RUTLAND, P. O. BOX 102, Gastonia, N. C. Tel. 7993

Published Monthly by

W. R. C. SMITH PUBLISHING COMPANY

Charlotte, N. C., and Atlanta, Ga.

W. J. ROOKE ..... *Chairman of the Board*
RICHARD P. SMITH ..... *President*
T. W. McALLISTER ..... *First Vice-President*
E. W. O'BRIEN ..... *Vice-President*
A. E. C. SMITH ..... *Vice-President*
O. A. SHARPLESS ..... *Treasurer*
A. F. ROBERTS ..... *Secretary*
SEBA J. JONES ..... *Asst. Secretary and Treasurer*

Publishers Also of

SOUTHERN POWER & INDUSTRY — SOUTHERN HARDWARE
SOUTHERN BUILDING SUPPLIES — SOUTHERN APPLIANCES
TEXTILE INDUSTRIES — SOUTHERN AUTOMOTIVE JOURNAL

In This Issue

Lighting replaces bank's burglar alarm	**18**
Ample space is key to wholesaler's program	**20**
Dallas tries fluorescent street lighting	**23**
The South's most electrified house	**24**
Preventive maintenance eliminates breakdowns	**26**
Automation through electronics—Part 3	**28**
New lighting modernizes clothing store	**30**
Built-in appliances open fertile field	**32**
1955 Adequate Wiring Conference	**34**
Potomac Edison's new load dispatching center	**36**
Distribution substations in system planning	**40**
Notes on new utility equipment	**42**
Electrical South data sheets	**44**

Economic comment	**12**
Association directory	**48**
Industry news	**52**
Dates ahead	**58**
News about people	**66**
Bulletins and booklets	**70**
Technical books	**74**
New product news	**75**

TO HELP THE BUSY READER—

An Arkansas contractor was given the assignment of installing enough **light to replace burglar alarms** in a new Little Rock bank building. The result of his installation has not only answered that request, but has also provided bank officials with the beautiful building they wanted. See **page 18.**

A new Electrical South feature beginning on **page 36** is the section which will appear each month entitled **"The Utility Engineers' Forum."** The section will contain several articles of interest to utility engineers. Also included is a page of **Notes on new equipment.** See **page 42.**

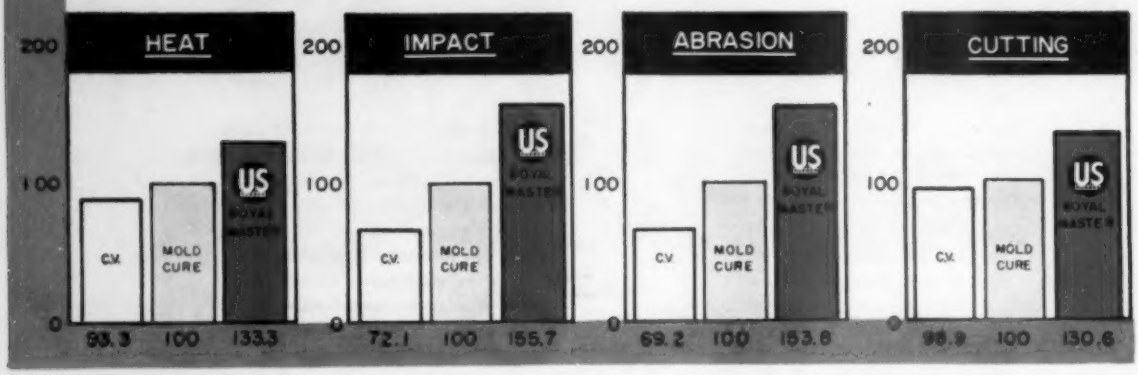
An Anniston, Ala., home may well qualify as **the South's most electrified house.** Details of this interesting installation, including a list of its 50 separate applications of electricity, are given on **page 24.** A 400-ampere service entrance was installed to take care of the electrical load.

Preventive maintenance eliminates breakdowns of manufacturing machinery for a Salisbury, Md., manufacturer of gasoline pumps. The plant's maintenance engineers are primarily concerned with motors, and the chief electrician discusses on **page 26** the procedure of keeping motors in top condition.

Copyright 1955, W. R. C. Smith Publishing Co., Atlanta, Georgia

STARTLING

Comparative performance of portable cords related to major life factors.



New U. S. ROYAL MASTER portable cord

PROVES SUPERIOR TO ALL OTHERS IN EVERY SERVICE FACTOR!

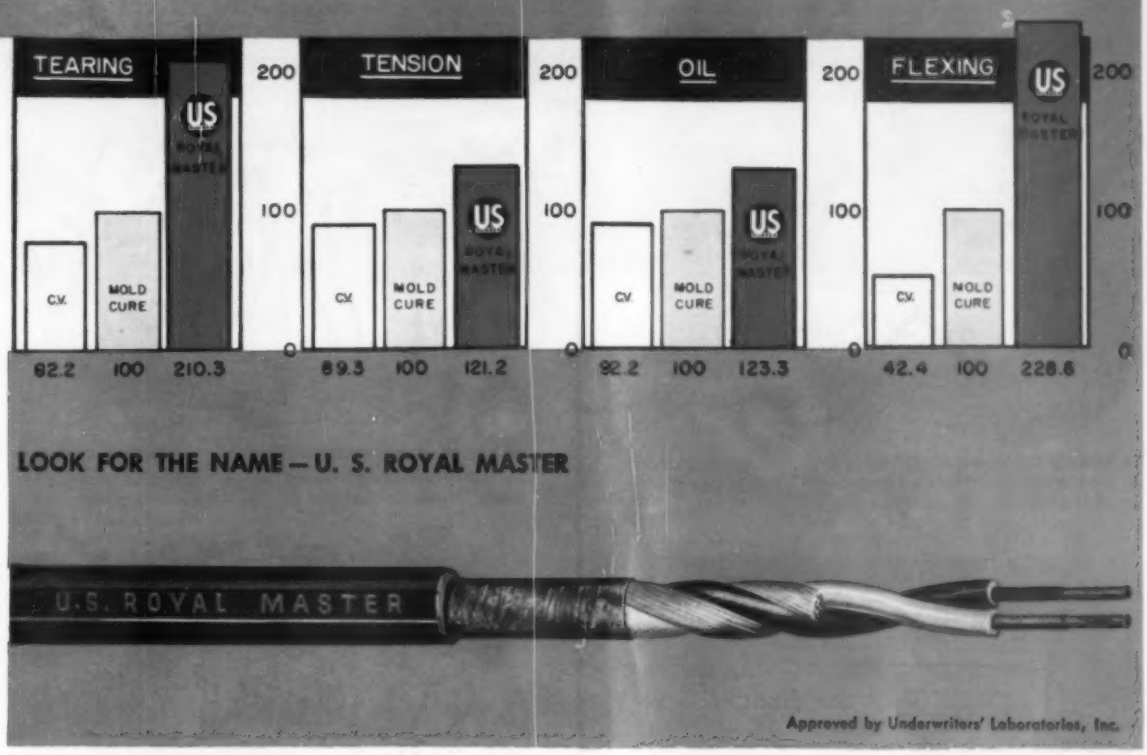
Newly developed U. S. Royal Master Cord gives almost twice the service of other molded cords — gives $1.88 value for every cord $1.00!

Life factor charts illustrate outstanding superiority of new U. S. Royal Master over the average of both the molded cords and the short-lived continuous vulcanized cords of other makes.

US RUBBER

UNITED STATES
ELECTRICAL WIRE & CABLE DEPARTMENT

EVIDENCE!



LOOK FOR THE NAME—U. S. ROYAL MASTER

Approved by Underwriters' Laboratories, Inc.

Cord construction completely reexamined. Over two years ago, U. S. Rubber engineers began a thorough reexamination of electrical cord design and construction. More than a thousand cords, including those of all major competitors as well as our own U. S. Royal Cord, were thoroughly and painstakingly analyzed. Over 10,000 tests were made to determine the principal causes of cord failure.

Every possible life factor was carefully and honestly appraised to find its relation to overall cord service.

With the findings at hand, "U. S." Engineers then drew upon their 64 years of experience in the manufacture of fine quality wire and cable to produce this exceptional new cord.

Every fault uncovered by the exhaustive two-year testing was tackled and solved.

Tested and proved. The new U. S. Royal Master was then tested against all competitive cords—installed in outside plants for final on-the-job corroboration.

U. S. Royal Master Cord proved itself to be unquestionably the finest cord you can buy! So superior, it gives almost double the service life of the average of competitive molded cords—actually gives you $1.88 in value for every cord dollar!

Prove for yourself the phenomenal superiority of U. S. Royal Master. Write to address below for FREE descriptive booklet illustrating the superiority of the U. S. Royal Master Cord. And get in touch with your "U. S." distributor today!

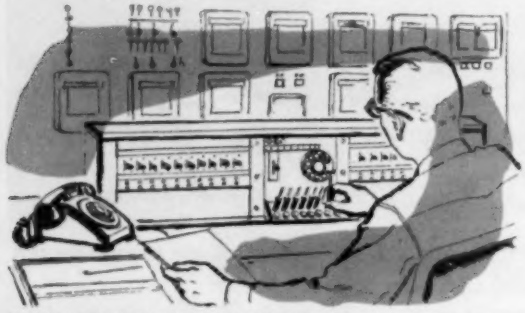
RUBBER COMPANY
ROCKEFELLER CENTER, NEW YORK 20, N. Y.

6 ways to save money in communications

If you want to save money and, at the same time, increase efficiency, let the Bell System furnish your communications. To get the facts, Bell System engineers will gladly make a joint review with your people. Ask your Bell telephone representative for more information.

BELL SYSTEM GIVES YOU COMMUNICATIONS AT LOW COST

TAILORED COMMUNICATIONS—Bell System engineers fit your communications to your needs. You get precisely what you require. No more, no less.



FLEXIBLE COMMUNICATIONS—Designed to meet your exact requirements, Bell System communications may be expanded or rearranged to match the changing needs of your business.

NEWEST EQUIPMENT—The latest developments in communications equipment are available to keep your service at peak efficiency without investment of your capital.

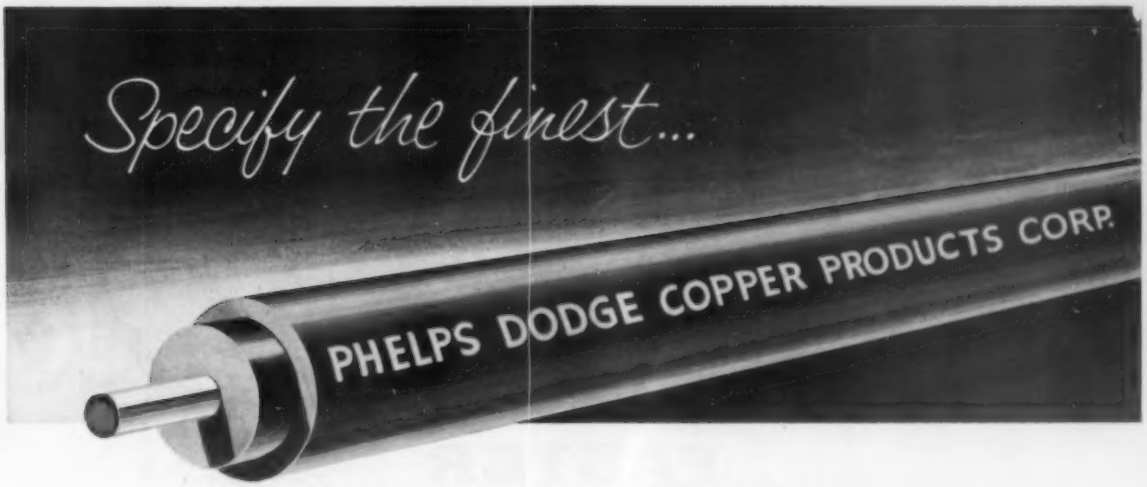
ROUNDED EXPERIENCE—You benefit from years of Bell System experience with specialists in all phases of communications.

RELIABLE MAINTENANCE—You are relieved of repair and replacement worries. And Bell System preventive maintenance insures that your communications stay reliable.

YOUR MONEY is available to invest in revenue-producing projects, not tied up in communications equipment. A fixed monthly charge covers your exact needs.

BELL TELEPHONE SYSTEM

TELEPHONE MOBILE RADIO TELETYPEWRITER INTERCOMMUNICATION AND PAGING SYSTEMS TELEMETERING AND REMOTE CONTROL



Phelps Dodge Habirite-Habirprene!

Rely on this highest quality cable—it works where others fail

The term "RR" is only a name, not an assurance of quality. Instead of ordering just "RR" cable, insist on Phelps Dodge Habirite-Habirprene—developed through years of experience in designing and making high voltage cables. Habirite-Habirprene exceeds the trade's highest standards of quality and reliability.

Phelps Dodge Habirité insulation, a specially engineered butyl rubber compound, has a service dependability record unapproached by any other type of rubber insulation. Habirite is greatly superior to old-fashioned insulations for these reasons:

- Much greater resistance to heat and oxidation. This permits a higher temperature rating, with consequent reduction in conductor size and in cable cost.
- Much greater resistance to ozone—present around high voltage equipment.
- Much greater mechanical toughness affording maximum protection against damage from tools, stones and other installation hazards.
- Better electrical properties—giving a greater safety factor in operation.
- Maximum uniformity of finished product—due to controllable uniformity of raw materials.
- Elimination of seams which cause weak spots—through use of Phelps Dodge extrusion insulating process.

Phelps Dodge Habirprene sheath, a unique neoprene compound, is especially made to be extra resistant to corona, one of the worst enemies of high voltage cable. This *extra resistance to corona* is an exclusive Phelps Dodge feature. It provides a greater safety factor in operation and has contributed to the remarkable reputation and service record of Habirite-Habirprene.

When you specify Habirite-Habirprene, you are assured of getting "RR" cable with the utmost in safety and durability. Habirite-Habirprene is the result of Phelps Dodge's rigid quality standards, long experience, expert engineering and vast facilities.

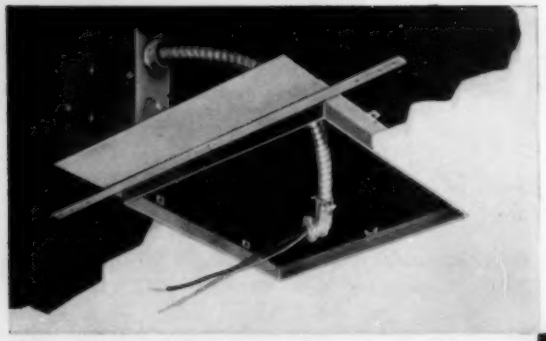
PHELPS DODGE COPPER PRODUCTS CORPORATION

SALES OFFICES: Atlanta, Boston, Buffalo, Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Fort Wayne, Greensboro, N. C., Houston, Jacksonville, Kansas City, Mo., Los Angeles, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Roanoke, San Francisco, St. Louis, Seattle, Washington, D. C.

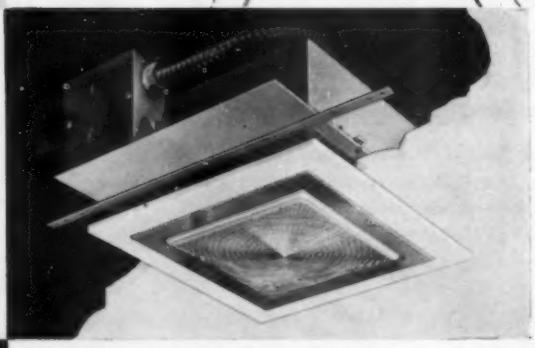
ART METAL

makes your wiring

EASIER *and* FASTER



The Binary Plaster Frame of Art Metal units has complete installation equipment including attached junction box, wire, Greenfield and two mounting rails.



Complete specifications on Art Metal pre-wired plaster frame and lens boxes are found in Bulletin 254. We suggest you write for this bulletin . . . it'll show you how to save installation time and money on your next job!

Art Metal recessed lens box housings are easily installed as the job nears completion. Vertical slotted mounting holes provide adjustment for ceiling thickness from ½" to 2".

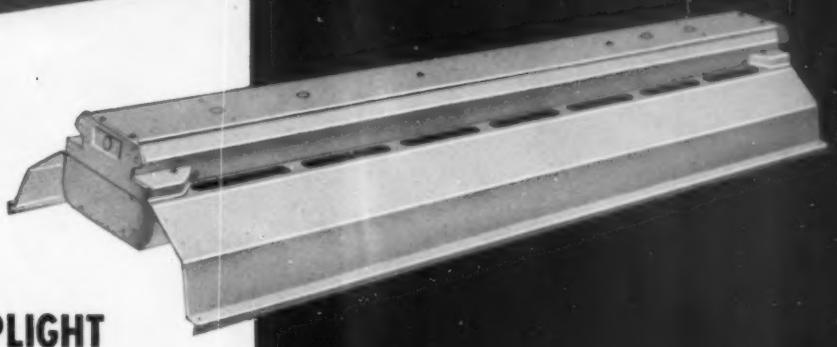
THE **ART METAL** COMPANY

CLEVELAND 3, OHIO

Wheeler "D" LINE

the "NEW LOOK" in INDUSTRIAL LIGHTING

New design features for better seeing.



1 MORE UPLIGHT
to reduce contrast for seeing comfort. Exceeds new RLM Standards.

2 MORE EFFICIENCY
to start with and higher maintained efficiency due to self cleaning features.

3 MORE PROTECTION
for lamp holders to minimize dirt and moisture problems.

PLUS

all the extra quality features that have distinguished Wheeler lighting fixtures since 1881.

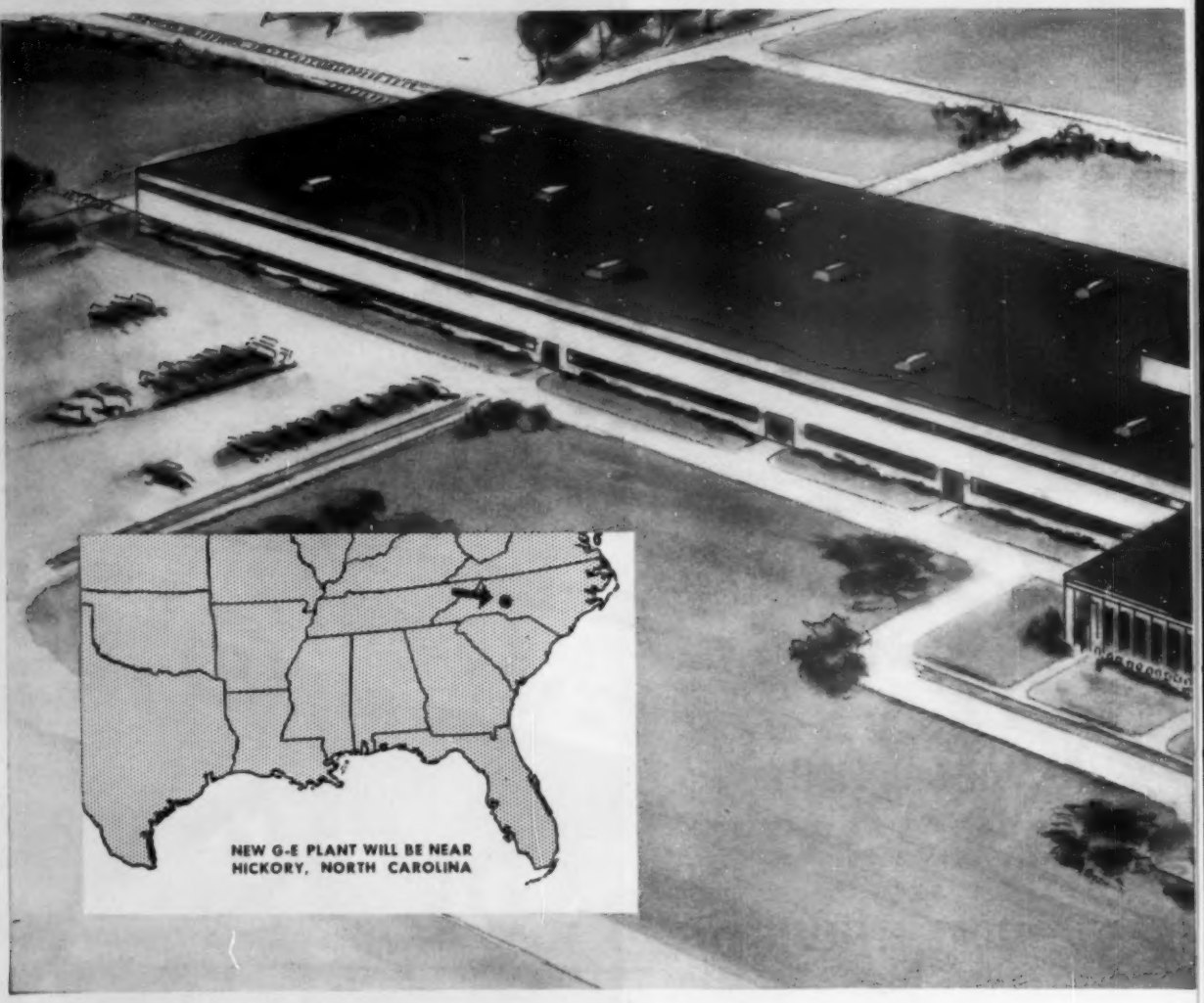
Wheeler REFLECTOR COMPANY

Distributed Exclusively through Electrical Wholesalers

WHEELER

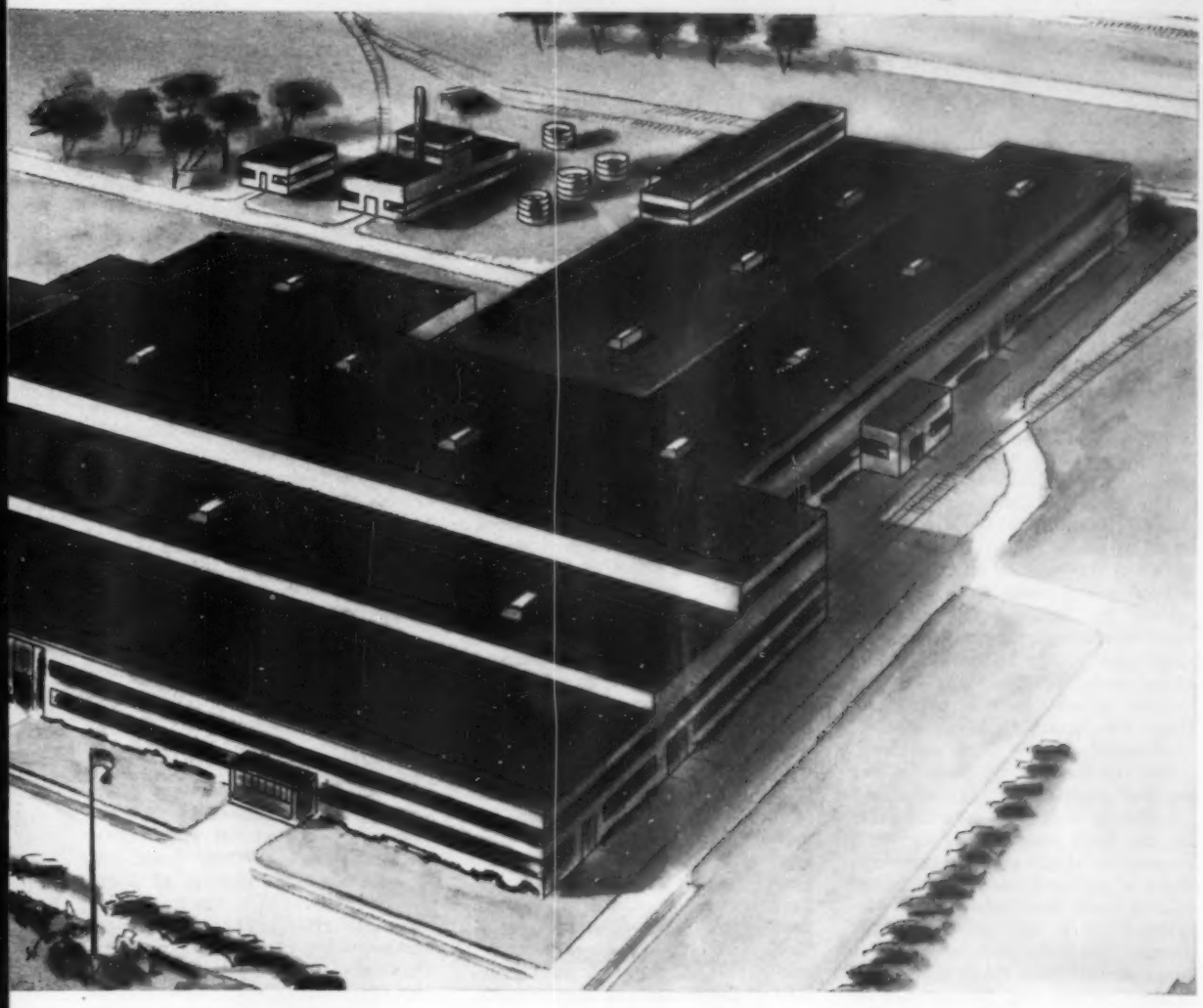
215 CONGRESS STREET, BOSTON 10, MASSACHUSETTS

Another G-E transformer plant



NEW GENERAL ELECTRIC PLANT WILL MANUFACTURE A COMPLETE LINE OF POLE-TYPE DISTRIBUTION TRANSFORMERS

to serve the booming South



NEW TWENTY-MILLION-DOLLAR DISTRIBUTION TRANSFORMER PLANT TO BE BUILT IN HICKORY-NEWTON-CONOVER AREA OF NORTH CAROLINA

Located in the foothills of the Piedmont Range within 100 miles of Charlotte, this new General Electric plant is scheduled for completion late in 1956 and will eventually employ over eleven hundred people. The second major G-E transformer expansion into the South—General Electric's Medium Transformer Plant in Rome, Georgia, was opened in May, 1954—this new plant will build distribution transformers for electric utility and industrial use. It should enable General Electric to better serve your growing electrical needs. General Electric Company, Schenectady 5, New York. 431-29

Progress Is Our Most Important Product

GENERAL ELECTRIC

Economic comment

by J. Whitney Bunting, Ph.D.

Labor-management relations – Part II

◆ IN SPITE of the fact that Congress felt a heavy sentiment in favor of legal action to quell an unsettled labor picture and consequently passed the Taft-Hartley Act, only the most incurable optimist can hope that legislation can solve the problem. The law can only provide the rules of the game and should be equitable to all parties concerned. This is a question of human relations only. The basic issues are still present, no matter how one might try to legislate against them.

The first positive approach in such a problem is to attempt to evaluate the reasons for the breach between the parties concerned. In a good many cases this has been caused by the gradual growing apart of management and the labor employed by it. There are many other social relationships of like nature, where, over a period of time, two individuals or groups may withdraw one from another.

But, in these same cases, if the original goal that brought the two together is strong enough, they can be led back together again with reasonable study and the development of a strong plan. The original goal of labor and management was production. It still is the fundamental purpose, and when both sides realize that their individual returns (wages and profits) can be secured by the successful completion of this goal, then a great step forward has been accomplished.

Strikes have reasons

Whenever strikes occur one can be sure that there is some cleavage in industrial relations. Failure to recognize this fact is the foremost reason why legislative means usually fail to overcome the real issue at stake. A worker must trust his employer if he is to get the greatest amount of job satisfaction from his employment. It should be made clear, also, that no security of employment exists if there is the slightest distrust of the employer. Under such conditions there is a natural field for struggles and clashes between both sides.

The worker has the right to be considered as a human being with problems of his own. Management's interest should not stop with the closing whistle of plant operations. It is just as much a function of management to assist in the workers off-hour problems as it is to provide cafeterias and library facilities during work hours. If this instruction is firmly planted in the mind of the industrial relations manager, his job will hold more than mere contract negotiations.

Organized labor has opposed such practices by management as being essentially paternalistic. Such practices should belong to the union and not the employer is the claim. Although such a stand increases the power and influence of the union, it is not an excuse for management's avoidance of their responsibility. There are many fine examples of management's interest in their workers, and in most cases, productivity is high and cost relatively low. Management cannot lessen their interest in human relations and expect the same results.

Management not vocal

For the past fifteen years management has lost considerable "face" with the general public for failing to express itself adequately on labor-management issues. True enough the National Association of Manufacturers has championed the industrialist position. However, it is the actual business men who have been more or less content to let George (the N.A.M.) do the whole job. Perhaps the Wagner Act may have had some bearing on their silence. It is true that it was considerably more difficult for business men to publicly discuss their position in labor relations under the law. Nevertheless, this silence has been damaging to management's reputation with the general public.

Educators who specialize in labor-management study programs almost unanimously report that the young industrial junior executive avoids taking active part in group discussions for fear of stating company policy. If such policy would become public, then perhaps it might be a lever for more intensive union activities within their plants. Thus, top management sometimes doubts the merit of sending their personnel to such joint discussion groups.

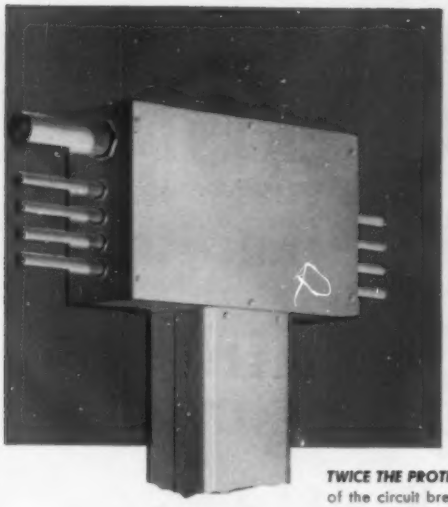
The point forgotten is that a good industrial relation policy can do no damage even if discussed by junior management personnel in such a group. In fact, it may lead to a solution of critical problems in other industries that also have representatives in attendance.

Education helps both sides

Labor representatives are often charged with belligerency in their publicity and official statements. True enough, for their basic job is to mold the opinion of their membership toward the goal they strive to attain. There are many instances of group spirit being charged to fever pitch by belligerent utterances. This, however, is not confined to labor problems. It is equally evident in high-powered sales conferences and pre-game athletic rallies. It is, in short, a form of mass psychology, the only kind some labor leaders understand.

It must be reiterated, however, that management must learn to sell itself by taking a more active participation in forums, community meetings, and the like. In turn, labor leaders must undertake the task of learning all forms of mass psychology and control of group action. Only then can both sides of the issue be presented fairly and adequately so that the public can make its decision on the true merits of the case.

Dr. Bunting, well-known southern economist, is president of Oglethorpe University, Oglethorpe Univ., Ga.



TWICE THE PROTECTION, TWICE THE CONVENIENCE! Famous Duo-Guard Pushmatic circuit breakers—the envy of the circuit breaker industry—protect circuits two ways—with a thermal bi-metal and a magnetic solenoid. So easy to operate. *Just push the button.*

NOW...BULLDOG PUSHMATIC CIRCUIT PROTECTION IN A

narrow, neat, space-saving panel

TRIM "NP" ELECTRI-CENTERS EXTEND TO ANY CEILING HEIGHT, ELIMINATE UNSIGHTLY CONDUIT

"NP" means Narrow Panel. And that means an attractive Pushmatic Electri-Center® you can install in space-restricted quarters, or where good looks are good policy.

BullDog engineers have designed this panel to fit into a standard "8" H-beam, or to surface-mount unobtrusively behind doors, in hallways, on non-structural walls—*anywhere!* It is compact—only 6¾" wide. Its many features include famous DUO-GUARD Pushmatic protection, wireway extensions and pull boxes to conceal wires and eliminate naked conduit, easier installation.

It is impossible to point out all the advantages of the Narrow Panel Electri-Center here. But a BullDog Field Engineer or Qualified Distributor will be pleased to show you its many saleable features. Or, write: BullDog Electric Products Company, Detroit 32, Michigan.

©BEPCO

IF IT'S NEW
. . . IF IT'S DIFFERENT
. . . IF IT'S BETTER . . . IT'S

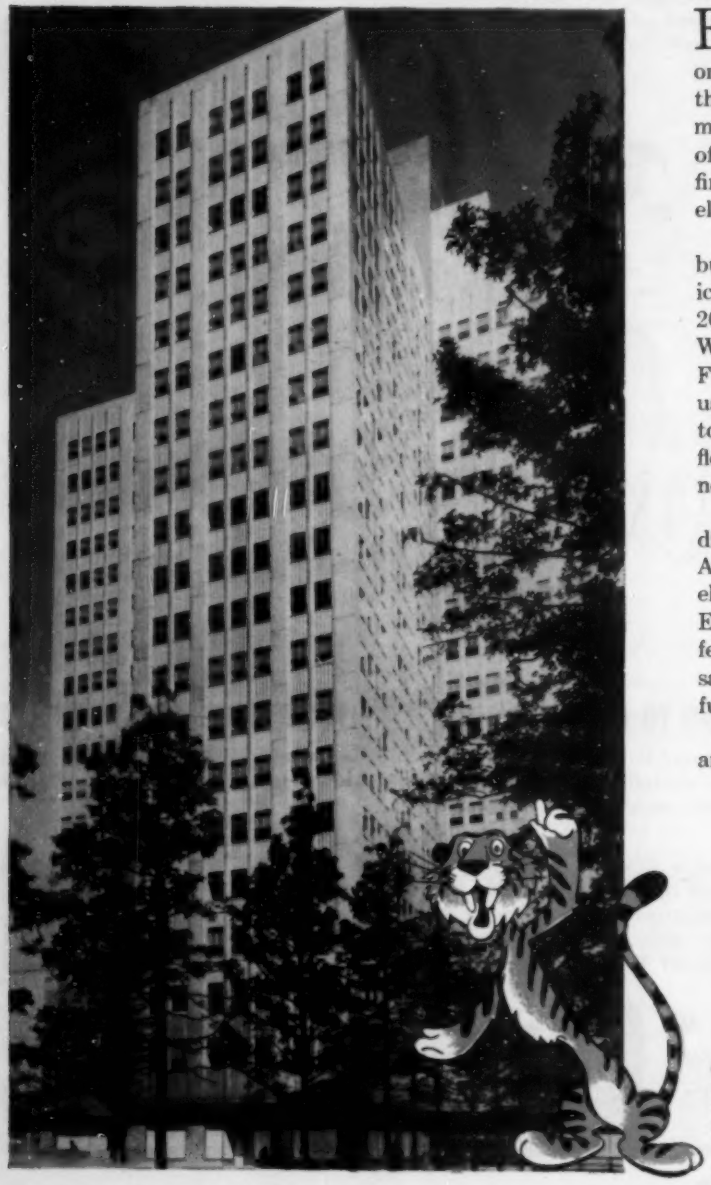
BULLDOG
ELECTRIC PRODUCTS COMPANY
A Division of I-T-E Circuit Breaker Company

Export Division: 13 East 40th Street, New York 16, New York. ***In Canada:*** BullDog Electric Products Company (Canada), Ltd., 80 Clayson Road, Toronto 15, Ontario.

CONSULT THE FOLLOWING SOUTHERN REPRESENTATIVES:

Wilson Electrical Equipment Co., 2930 Commerce St., P.O. Box 1725, Houston, Tex.; 101 E. Maple St., San Antonio, Tex. • Walker Electrical Co., Inc., 70 Bennett St., N.W., P.O. Box 8. Station D, Atlanta, Ga. • Standard Electric Mfg. Co., 2401 Federal St., Dallas 1, Tex. •

6 miles of TIGER BRAND control the elevators in new Gateway Center buildings



ELEVATOR CONTROL CABLE leads a tough life. It must be light, to reduce the load on the car. It must be flexible, to withstand the continuous movement and vibration. It must be strong, to prevent the long length of cable from tearing itself apart. It must be fire-resistant, to guard against disastrous elevator shaft fires.

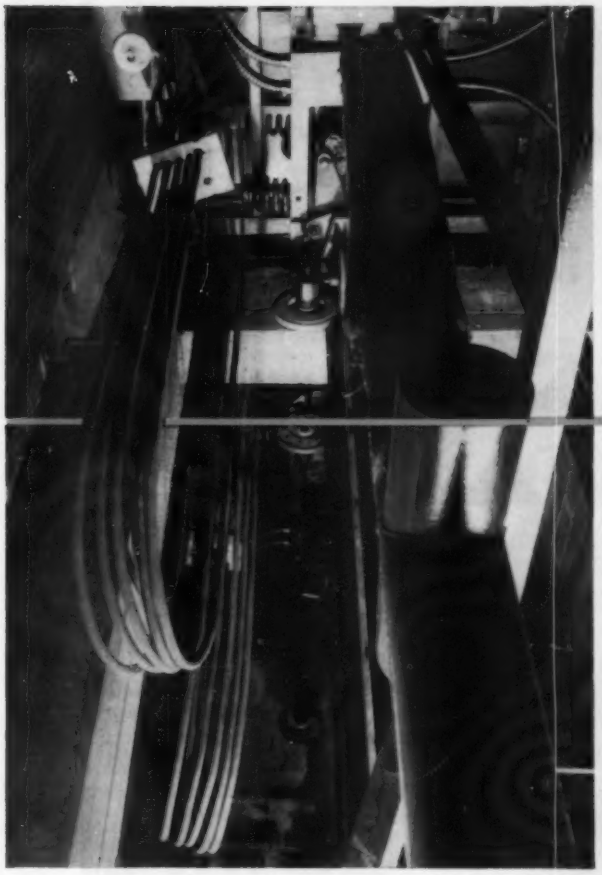
For the magnificent Gateway Center buildings in Pittsburgh, shown here, American Steel & Wire furnished some 6 miles of 20 and 30-conductor control cable for the Westinghouse Selectomatic elevators. Flame-resistant insulation and jackets are used, and each cable is reinforced with tough steel strands. The cable had to be flexible enough to withstand movement, but not so flexible that it would kink.

These are desirable features for many different kinds of electrical wire and cable. And although you probably don't build elevators, you can rely on any Tiger Brand Electrical product to combine all the subtle features that make for easy installation, safe, reliable operation, plus a long and useful life.

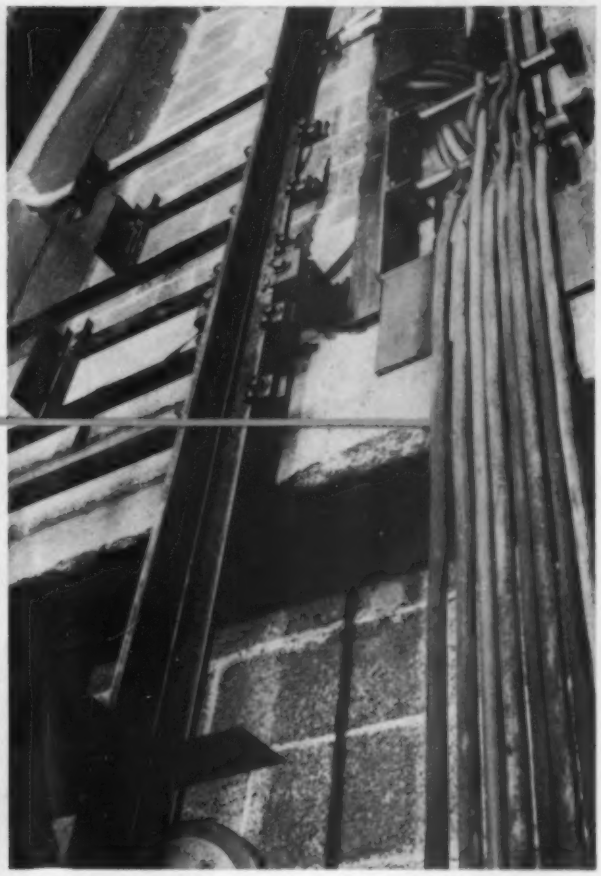
Send the coupon for more information on any Tiger Brand product.

AMERICAN STEEL & WIRE DIVISION,
UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO,
PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.,
SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

Gateway Center, famous Pittsburgh landmark, where Westinghouse Selectomatic Elevatoring matches calls, cars and floors to put elevators where they're needed, when they're needed.



Tiger Brand control cables are at the left. The hoist ropes, visible at right, are also made by American Steel & Wire.



Control cable terminal box is located half-way up the shaft. Flat steel rods projecting from elevator track actuate induction coil on car to control automatic leveling system.

A STANDARD TIGER BRAND CABLE FOR EVERY SPECIAL JOB!

paper & varnished cambric cable
asbestos wire and cable
aerial, underground & submarine cable
shovel & dredge cable
mold cured portable cord
machine tool & building wire
special purpose wire & cable

SEND THE COUPON

American Steel & Wire Division
Room BE-25, Rockefeller Building
Cleveland 13, Ohio
Please give me more information about Tiger Brand cable for .....
Name .....
Firm .....
Address .....
City ..... State .....

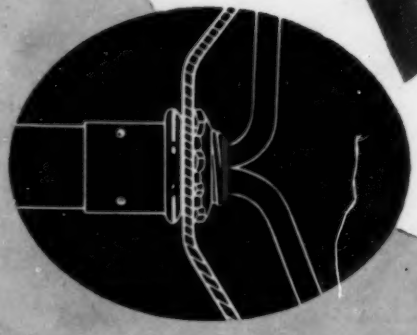
USS Tiger Brand ELECTRICAL WIRE & CABLE USS

UNITED STATES STEEL

Red Throat

B-M 21B, THE NEW INSULATED THROAT INDENTER CONNECTOR FOR E.M.T.

Four Ways Finer



1. Protruding rounded red plastic lip of bushing prevents cutting of insulation—eliminates shorts.
2. Full thread screws into all conduit fittings. Lip of RED THROAT bushing protects thread from damage.
3. Deep dished eight pronged lock nut is easier to drive on—screws flush to shoulder and digs into metal of box for vibration proof positive ground.
4. Permanent locked-in bushing insures smooth burr-free raceway for easy fishing. No extra work and costs no more.

Briegel, the Original Indenter Fittings are neater in appearance, easier and faster to use. Installation is simple and less expensive. Two quick squeezes sets them forever. Try B-M Indenter Fittings and get more profits from each job!

ALL BRIEGEL FITTINGS ARE U. L. APPROVED AS CONCRETE-TIGHT

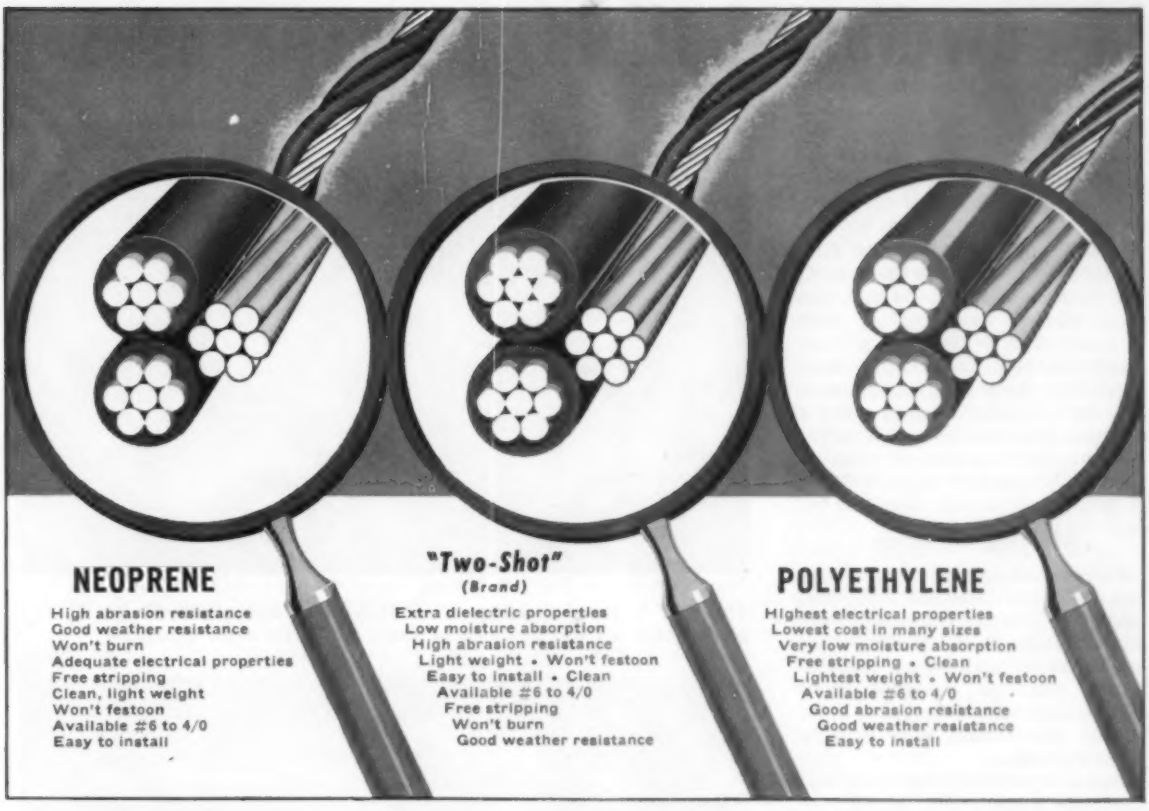
Order from Your Wholesaler!

All B-M Indenter Fittings are U.L. Approved as concrete-tight and for general use (File Card E10863). Also comply With Federal Specifications W-F-406.

BRIEGEL METHOD TOOL CO.
GALVA • ILLINOIS

Warehouse Stocks in Principal Cities for Immediate Delivery!

Choose your service drops from the K/W TRIPLEX TRIO



YOUR CHOICE of service drop insulation is readily available in Kaiser Aluminum's K/W Triplex Trio.

Whether you prefer Neoprene or "Two-Shot" or Polyethylene, you can specify K/W with full confidence of getting the highest quality materials to meet your needs.

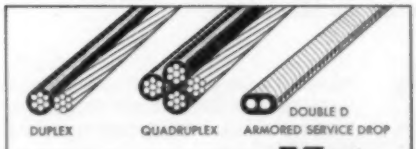
For example, if you want a premium-type product, you can order K/W's long-accepted "Two-Shot" Triplex at slight additional cost. The phase wire insulation—a 2/64" inner layer of special rubber (3/64" on stranded wire) with 2/64" jacket of tough Neoprene. "Two-Shot" Triplex provides added dielectric properties and weather resistance.

Otherwise you can specify regular K/W Neoprene or Polyethylene insulated Triplex or covered line wire for open wire services. No matter which conductor you choose, you are assured of long trouble-free service when you use Kaiser Wire.

If your services go through trees, ask your Kaiser Aluminum conductor engineer for advice on suppliers of economical tree guards, or you may want to consider a new Kaiser Aluminum development—"Double D Armored SD."

For complete information on Kaiser Aluminum conductors, contact our sales office listed in your telephone directory or one of our many distributors. Kaiser Aluminum & Chemical Sales, Inc., *General Sales Office*, Palmolive Bldg., Chicago 11, Ill.; *Executive Office*, Kaiser Bldg., Oakland 12, Calif.

ADDITIONAL SERVICE DROP PRODUCTS



KAISER K/W

Kaiser Aluminum

THE NATION'S LARGEST PRODUCER OF TRIPLEX AND ALUMINUM WEATHERPROOF CONDUCTOR

POLYETHYLENE & NEOPRENE WEATHERPROOF AND TRIPLEX • QUADRUPLEX • ACSR ALL ALUMINUM CONDUCTOR • RECTANGULAR, SOLID ROUND AND TUBULAR BUS

Light replaces burglar alarm in new bank building

by S. W. Ellis

◆ WHEN THE OFFICERS of the First National Bank at Little Rock, Ark., determined that the time had come when a new building must be constructed to take care of their modern banking needs, they took their depositors into consultation. A letter addressed to each asked a question and solicited an answer:

What facilities and services do you want your new bank building to offer?

Lighting for safety

From the hundreds of answers received, two predominating requests seemed to link themselves into one unit: More light and more safety for making night deposits. These customers wanted their bank to provide protection or safeguards while they were making night deposits.

Some customers had had unfortunate experiences when they were transporting the day's receipts from a business to the bank's night depository. Holdup men lurked in dark alleys, doorways, and parking places. There had been a number of robberies.

Commercial customers were not the only victims. Working people who were forced to deposit money at night also feared attack from thieves. They wrote the bank what they wanted:

"Give us light. Give us a parking place adjacent to the bank that will be as bright as day at midnight. Give us a small night lobby with a depository so flooded with light that no footpad would dare lurk in the vicinity."

These were the requests that officers discussed with the architect, who was asked to create a new building that would shine brilliantly throughout the hours of darkness.

"We want a building that will be beautiful. And we want it to become known as the brightest spot in town."

The First National Building, Little Rock, Ark., makes a brilliantly lighted corner. Lighting was designed to insure safety for night depositors.

Recessed fixtures provide warm, friendly lighting for the officers' section flanking the lobby, and for the office machinery room.

That was the order given the architects, Wittenberg, Delony and Davidson. Working with electrical contractors, the I. K. Electric Co., they designed a building that turned out to be a modern miracle of lighting. No burglar alarm system was installed, because none would be needed.

All night long, the building, with glass walls on three sides, shines like a transparent shell. Outside

and inside, from sidewalk to roof, it is flooded with light — fluorescent light, incandescent light, light from hundreds of feet of cold cathode tubes.

Police approval noted

When this building was finished in late November, and the lights went on for the first night, the spectacle was startling. Bank officers and architects, electrical engineers and depositors, were convinced that modern lighting had achieved safety features beyond barred doors and police protection.

The Little Rock Chief of Police, who inspected the finished building, declared that the lighting system practically eliminates break-in attempts after closing hours. Even the alley, flanking the one solid wall of the building, is lighted with brilliant floodlights.

"I'd like to see all cities install a system of alley lighting similar to this used by the bank," Chief Pyle said. "Our police records show that few burglaries occur in those sections of the city equipped with good lighting facilities. Burglars and most holdup men work in darkness."

Lobby of the bank building is as bright as day in every corner with light provided by recessed incandescent fixtures.

48-inch fluorescents, a total of 732 tubes, were used in several departments. 175 incandescents and 1,048 feet of cold cathode tubing were used.

Jalousies used

The sides of the building facing two streets are all glass and aluminum. The third side, facing the drive-in auto bank, is also glass.

On the two street sides, aluminum jalousies, mounted on the marquee above the plate glass, are backlighted with four rows of cold cathode light tubes—688 feet. Incandescent fixtures, recessed in the marquee supporting the jalousies, provide more light for first floor exteriors.

The aluminum jalousies, in banks measuring two by 17 feet, manually operated, are a part of the lighting system as well as a modern decorative feature. When opened in the daytime, they save lighting costs. Opened at night, they reveal the backlighting from the cold cathode tubing and also reflect light.

Outside areas

Sidewalk areas and first-floor surfaces are lighted by 17 incandescent fixtures recessed in the bottom of the marquee. The drive-in lobby entrance and exit are lighted with 18 fluorescent fixtures. On the west side of the building and in the adjacent parking lot, flood lamps provide complete lighting, valued by bank patrons who do not like to park their cars some distance from the bank, and then be forced to go through poorly lighted streets to the bank's night depository.

For the 38,000 square-foot building, 732 fluorescent tubes were needed, 175 incandescent lamps, and 1,048 feet of cold cathode tubing.

"We installed underfloor raceways for flexibility of the telephone openings," stated A. I. Korenblat, owner of the I. K. Electric Co. "Electric wiring plays an important part in the safety of this bank, and safety here calls for adequate telephone openings in many different spots."

Music system

This electrical contractor also installed a system that provides muted background music during business hours. Customers asked for this. Music is piped into the bank over telephone lines from the wired music company that supplies it. Facilities for the music were installed in every department of the bank, including each of the teller's booths in the auto lobby.

Electric service for the new building is provided with a transformer vault set under the sidewalk. The electric power feeds in-

(*Continued on page* 82)

Ample space is key to wholesaler's program

by L. H. Houck

One of the best features of Harry Cooper Supply Company's building is the ample parking area and efficient loading docks which are available to contractor-customers.

◆ A NEW BUILDING completely air conditioned with 100,000 square feet of space is the realization of an objective requiring "plenty of parking space and the largest showroom under one roof" for Harry Cooper Supply Co., Springfield, Mo. But the new building is only one facet of the company's constant campaign to increase their value to the contractors whom they serve.

A highlight of this campaign was a series of product demonstrations held in the company's auditorium and lasting from three days to a week during the past year from June 15 to September 15. A sample is the program for August when demonstrations were set up like this:

August 10-15 — Wiremold Co., Victor Meier, district sales manager.

August 17-22 — Square D Co., W. D. Smiley, field engineer.

August 24-29 — Century Electric Co., W. C. Knappenberger, district manager.

August 30-Sept. 5 — Federal Products Co., W. M. Spain, district manager.

Inside the warehouse section of the building, load trucks and fork lifts facilitate storage of the large inventory stocked by the Cooper firm.

Each month's program was outlined and sent in advance to electrical contractors served by the company so contractors could plan to attend. Product displays were arranged and set up in the display room by factory representatives,

A popular meeting place for contractors' association luncheons, and an ideal place for the demonstrations staged during the year, is the auditorium of the Cooper company, with a cafeteria and seating capacity of 100.

A manufacturer's representative prepares a demonstration in the auditorium.

and workmen and apprentices were invited to attend.

Field demonstrators

Correct product use and proper applications were the main topics, but the programs also provided an opportunity for the answering of questions. In addition to the store demonstrations of the product, the company's field engineers helped contractors in the field with on-the-job problems when the opportunity was provided.

To be sure that everyone interested knew in advance about each product demonstration, large posters were set up each month in strategic spots.

During one of these demonstrations a group of power use advisers for the REA attended and added their weight to the pitch to power use by showing use of motors, and effect of certain lighting on tones and its relation to interior decorating, adding selling points for the contractor.

Use of auditorium

Fourteen such meetings were held during the 1954 season with every demonstration attended virtually to capacity. Some overflowed and made extra meetings necessary.

The auditorium, incidentally, is a feature of the new Cooper building. It seats 100, has its own cafeteria, and the Springfield Electrical Contractor's Association holds its monthly luncheon meetings there.

The auditorium is available for the use of contractors, manufacturers and others who have need for such facilities and the end result is that it is in full use several times each month.

Technical assistance

Besides the factory product demonstrations, contractors are furnished technical aid by experts on the staff of the Cooper company. For instance, electric heating in this area is comparatively new and contractors often have many questions. The technical staff will assist contractors in making estimates, measuring up homes and computing requirements as well as layouts on the best methods for making the wiring installation. This type of service may be had on almost every type of product and job that the contractor will encounter.

In order that contractors can get quick service from large stocks and in order to help them reduce the inventory they need to carry, new facilities of the Harry Cooper company are designed to furnish quick parking and almost instant knowledge of material stocks.

Inventory system

A girl presides over a perpetual inventory system installed this year, and can furnish exact information on any of more than 20,000 items in stock. She can tell how many switch boxes or ½-inch conduit or some rarely called for item, such as an extra large capacity switch, are in stock and where they are located in the more than 85,000 square feet of warehouse space. All such information can be obtained by a contractor over the phone.

Bidding aids

The technical service also is equipped to help contractors with bids on large construction projects and to insure that the equipment and supplies will be available if he is successful in his bid.

Contractors who want to pick up their supplies never have to waste time looking for a parking space.

The warehouse area is all on the first floor level and the docks can

accommodate any number of over-the-road tractor trailer units at all times. Two overhead cranes are used in loading and unloading railroad cars from the spur tracks. Other equipment for handling merchandise in the shortest time consists of fork lift trucks and conveyors.

Nature of displays

The combination office and display room contains 15,000 square feet lighted by tiers of louvred slim-line fluorescent lights. Individual displays are featured so that contractors can bring their customers in and show them the actual merchandise instead of showing them a picture in the catalog. Since the new building was opened in 1950, an ever increasing number have been making profitable use of this display room.

Business founded in 1886

The Cooper business was founded in 1886 by Harry Cooper, father of Jack Cooper, now president and treasurer. Harry Cooper left a small town near London, England, in 1873 to farm in Missouri. The business has been in the Cooper family ever since and was first known as Cooper Brothers, plumbing and heating contractors. They bid successfully on such projects as the 1904 St. Louis World's Fair and contracted hotel and hospital jobs as far south as Gulfport, Miss. After three years of contracting, they closed the retail end of the business and went into the plumbing and heating supply business in 1910 in Springfield.

The volume had reached a point in 1918 where a branch was opened in Salina, Kansas. The electrical department was opened in 1934. Jack Cooper, president, graduated from the University of Missouri, and started in at the bottom to learn the electrical, plumbing and heating trade.

The elder Cooper passed away in 1943. The branches now include one in Tulsa and a warehouse in Pittsburg, Kansas, and the Springfield quarters are overcrowded.

Personnel record

The company bought the very extensive Fruehauf trailer plant in 1947 and it was laid out for "plenty of parking space and the biggest showroom you can get under one roof." The new plant was opened to the public on May 5, 1950 and more than 3,500 suppliers and retailers attended the opening.

Jack Cooper is president and treasurer; Harry R. Carson, vice-president, has been a member of the firm since it was founded and R. E. James, a veteran of 33 years, is head of the heating department.

O. M. Griffith, 16 years with the company, is manager of the electrical department, W. H. Owen, 15-year veteran, is head of purchasing department for plumbing; Harry Edwards, 27-year veteran is credit manager, and A. A. Summer is advertising manager.

Aerial view of the Cooper warehouse and office building. In 1947, when additional space was badly needed for expansion of the company, the very extensive Fruehauf trailer plant was purchased and set up to provide plenty of customer parking space and deluxe showroom facilities. When the new plant was opened to the public in May, 1950, more than 3,500 suppliers and retailers attended the opening. They have since been making profitable use of the display room in increasing numbers.

Conduit displays are an example of the efficiency which characterizes the company's warehouse storage bins.

Dallas tries fluorescent street lighting

◆ FIRST IN THE SOUTHWEST to adopt a fluorescent street lighting program, Dallas, Texas, is lighting its Main Street from end to end through the shopping district with 56, 30-foot-high, decorative fluorescent standards. Forty more of the fixtures will be installed on ten cross streets, relighting one block each side of Main.

The Dallas city council approved the project in December on recommendation of J. W. Monk, utilities supervisor, who said the cost of $76,710 would produce 60 per cent more light than has been available on Main for more than 40 years.

Work of replacing the old lights was started early in the year by the Dallas Power and Light Co., which buys, installs and maintains street lights under contract on an annual investment-replacement charge basis. With completion of the project scheduled for some time in March, the one-time, seemingly hopeless dream of a power company executive will have been realized.

Selling the job

T. C. Winter, assistant commercial manager for the power company, handles details of street lighting for the company. Street lighting, not normally under his jurisdiction, is in a sense a side job, but Mr. Winter likes street lighting and works at it whenever there is an opportunity.

In 1952, he began talking fluorescent lighting for the downtown district to Supervisor Monk, but the latter was not even lukewarm at that time. Mr. Winter didn't back away, however, and kept dropping in at the city hall with his fluorescent sales talk, and he kept it up for two years. Finally, along in the late summer of 1954, Supervisor Monk asked him if his company would be interested in installing one block of fluorescent lighting on a trial basis. Mr. Winter agreed and a $3,000 investment was made on a trial basis.

The pilot installation on one block went in on Main street in Dallas early in October of 1954, starting at a principal intersection, one corner of which is occupied by the famous Neiman-Marcus store.

by Baron Creager

That pilot installation did in six weeks what Mr. Winter had not been able to do with sales talk in two years.

Almost immediately everyone involved — merchants, mayor, city councilmen, Supervisor Monk and his staff — were first favorably impressed and then thoroughly sold, with the result that the $76,710 project sailed through the city council session with the ease of a routine matter.

In reporting on action of the city council and in quoting Supervisor Monk, The *Dallas News* said next day: "Installing the new lights on the cross streets will pave the way for future replacement of the old lights on Elm and Commerce." Elm and Commerce are shopping district streets parallel with Main and one block on each side thereof.

Supervisor Monk was directly quoted as saying he believes the Main Street project will lead the way to the eventual relighting of

(*Continued on page 27*)

Before modernization, Main St., Dallas, Texas, looking west from Ervay, Neiman-Marcus store on the left. In the first block lighting seen was from 11,405-watt, multiple, 6,000-lumen, square-base standards, with outer globes and glass canopies. Beyond the first block, lighting is mercury vapor.

The same scene after modernization. It was this block chosen for the trial installation of fluorescent lighting with five, four-tube, 21,000-lumen fluorescent luminaires, each on a 30-foot Union Metal pole. Mercury vapor lighting is still visible in the background.

The South's most electrified house

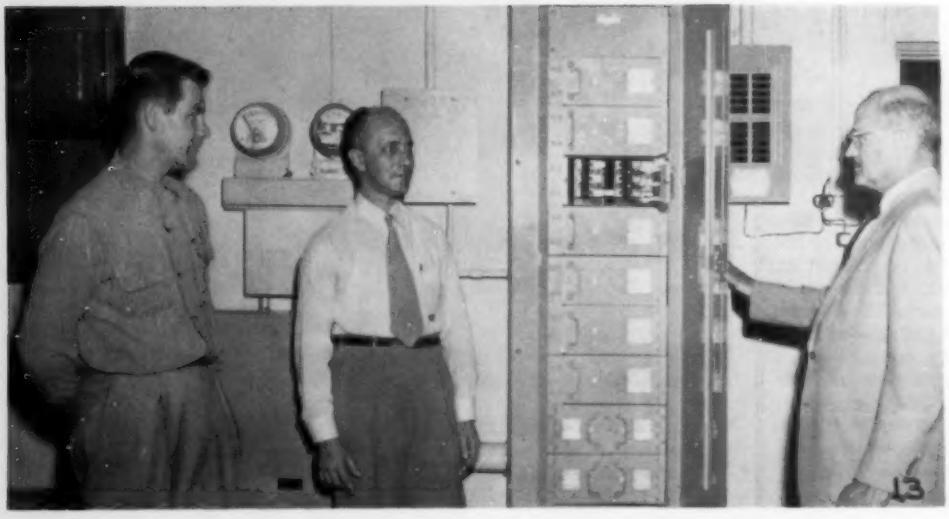
◆ In Anniston, Ala., the home of Mr. and Mrs. Farley Berman may well qualify as the most electrified house in the South and even the United States. The Berman home was built with the advice of Architect J. M. Hoffman and sales personnel of the Alabama Power Co., Birmingham and Anniston.

Over 50 electrical features incorporated in the home made it necessary to install a 400-ampere service entrance to take care of the electrical load.

More than 4,000 people visited the residence during a week that it was open for public inspection. They found every conceivable convenience had been installed for the comfort of the Bermans and their son, Bruce North. Unusual features of the home include a motor controlled television antenna, master switch near the head of Mr. Berman's bed from which all lights inside and outside of the house can be controlled, electrically-operated venetian blinds and draperies, a suspended island of concealed lighting for the recreation room, and jalousies which close automatically when it begins to rain and open when it stops.

Electricity serves Mr. Berman

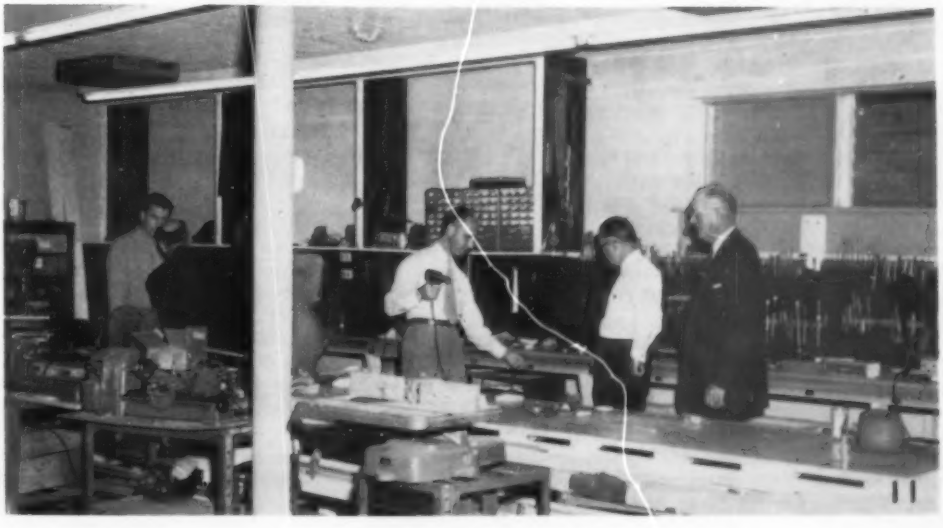
(*Continued on page* 79)



(Above) Touching the switch which controls vertical outside louvers, Mr. Berman turns them to let in the amount of daylight he wants in the breakfast area. (Left) Mr. Berman, center, J. M. Hoffman, left, architect of the house, and O. K. Seyforth, Division vice-president, Alabama Power Co., at the 400-ampere service entrance.

Exterior view of the Farley Berman home in Anniston, Ala., thought to be the most electrified residence in the South. The house is located at 1234 Champaign Ave., on the high elevation commanding a view of neighboring mountains. Practically all walls on the westerly sides of the house are floor-to-ceiling glass.

Kitchen of the Berman home is completely equipped with labor-saving devices for the convenience of Mrs. Berman and longtime family servant, Viola Leonard. Here, Mrs. Berman inspects one of the two waist-high ovens. Kitchen windows are treated with vertical venetian blinds, motor operated, and a motor-operated dumb waiter to the recreation room.



Looking over the extensive hobby-workshop are, left to right, Mr. Hoffman, C. M. Killian, Power company advertising manager; Mr. Berman, J. W. Holland, Alabama Power Division sales supervisor, and J. P. Hagerty, Anniston District manager for Alabama Power. The shop is served by six electric motors.

Chief Electrician Ralph Welsh of the Wayne Pump Co., inspects a transformer on his rounds in a preventive maintenance program of weekly, monthly, and yearly checkups, with no breakdowns in past four years.

Preventive eliminates

by Ralph Welsh
Chief Electrician, Wayne Pump Co.
Salisbury, Md.

◆ WHEN A CONTRACTOR recently approached us on the handling of electrical service in the event of breakdowns, we could only look quizzically at him and inquire, "What breakdowns?" For as firm believers in preventive maintenance, we carry out a periodic program of inspections with cleaning, lubrication, oiling and repair that precludes any interruption of machine operation.

When a preventive maintenance program is in effect, there is no occasion for breakdowns or burned up motors. Moreover, a schedule of inspection and care extends the life of equipment, cutting down costs of operation as well as costs of maintenance.

Importance of motors

At our College Avenue plant where lathes, milling machines, drill presses and welders must be kept in smooth operation for the manufacture of the gasoline pumps for which our company has become nationally known, we in electrical maintenance are most concerned about motors. At yearly inspections we remove ends and rotors, inspect and replace bearings, provide a thorough cleaning with carbon tetrachloride, and varnishing with air-dry enamel.

Certain motors have to be removed twice a year for these inspections, although in newer equipment, the manufacturer took into consideration construction that would keep motors clear of foreign matter.

Motors get a complete overhaul yearly. During late summer vacation periods, four or five of us go over all machines thoroughly. During these yearly inspections all wiring to and from the machines is inspected. All starters are inspected and cleaned with carbon tetrachloride. Electrical equipment on boilers is also checked at this time.

We use minimum size heaters in all magnetic starters. Acting as a safety valve, a minimum size heater is the heart of a machine. If anything goes wrong, the action of the heater stops the machine.

At our monthly inspections, all sleeve bearing motors are lubricated. We use only plastic covered wire on all machines that are subject to oil.

At weekly checkups all burned out lighting equipment is replaced. On this round, all machines are lubricated, for as maintenance men in industrial plants know, about 90 per cent of the trouble that turns up electrically on pieces of equipment will be found to be mechanical in origin.

We have found it a good practice to keep one man on all lubrications. He first oils all machines weekly, replacing any bad bearings at the time of oiling. He then greases. Any overheating, noises, or damage he finds, he reports in this weekly visual inspection.

One man for oiling

We believe it a good practice to have one man do all oiling and greasing because he will take pride in his work when he is commended for efficient performance. Placing the job with one man also fixes responsibility.

A word must be put in here for our machine operators. They become so attuned to the sound and touch of their machines, that they instantaneously sense any departures from normal. When anything goes wrong, they report promptly to us. They are our best trouble shooters.

Once a year we also install recording volt and ammeter on our services to make sure transformers and circuits are not overloaded. At these yearly inspections we also take samples of trans-

maintenance breakdowns

former oils, testing them for acidity.

We maintain a card recording system of each machine by number. Giving make, model, year, manufacturer, motor by the same number as the machine, bearing sizes that the motor requires, inspection date, what was done to the machine and recommendations regarding what should be done in the near future, the card becomes a recorded history of the maintenance on that machine. From the card we thus learn not only when next inspection is due but arrive at any trouble analysis faster through the recorded history. Furthermore, the history reveals how competitive products hold up against each other.

At yearly inspections when motors are removed, we make a copy of the serial number and size of bearings so that bearings can be replaced without removing the motors. Size of belts on machines is also noted at this time.

By taking all these precautions we have avoided breakdowns. We cannot recall a single breakdown over the last four years, thanks to our preventive maintenance program.

At weekly inspections, all machines are lubricated, wiring is checked, any bad bearings replaced. Overheating, unusual noises, or damage are watched for in this visual inspection. Below is card used in record system.

PREVENTIVE MAINTENANCE RECORD

MACHINE	
EQUIPMENT DESCRIPTION	INVENTORY NO.
	PURCHASE DATE
TYPE INSPECTION	INSPECTION PERIOD
ELECTRICAL	
TYPE EQUIPMENT	INVENTORY NO.
TYPE FRAME	PURCHASE DATE
SERIAL NUMBER	MFG'R
HP OR KW	VOLTAGE
AMPERES	SPEED
TEMP RISE	BULL NO. & SIZE
TYPE INSPECTION	INSPECTION PERIOD
LUBRICATION	LUBRICATION PERIODS

Dallas street lights

(*Continued from page* 23)

the entire downtown district.

"We have had nothing but favorable comment on the experimental section," he added, "and we feel sure the whole new installation will be well received by the citizens of Dallas."

The current project involves 12 blocks on Main Street for a distance of 4,300 feet, plus 20 short blocks on ten cross streets so that more than a mile of streets is being relighted.

New lights replace a system that was installed in 1914—more than 40 years ago — in which the standards were placed 60 feet apart. Some years ago a large number of mercury vapor lamps were installed.

The new standards are placed on 75-foot centers except at intersections. The fluorescent, four-multiple luminaires are each of 21,000 lumen output. This produces one footcandle plus at the street level, but at all Main Street intersections, the light measure is three footcandles. This is because a luminaire will be installed at each of four corners of the intersection.

The project involved removal of 92 outmoded standards. In all, 101 of the fluorescent luminaires will be in use — 96 in the current installation and five involved in the one-block trial.

Supervisor Monk estimated that the new lighting will add $4,500 annually to the Dallas street lighting bill.

However, he expects the favorable advertising accruing to Dallas to offset this additional cost. Although downtown night traffic safety was one consideration, community advertising carried equal weight, he said.

Automation through electronics

Part 3

by Robert J. Wilson, Sales Engineer
Photoswitch, Inc., Cambridge, Mass.

◆ THE CHEMICAL industries offer many opportunities for electronic control application. These would include, of course, such routine applications as conveying operations, packaging, etc.; but in addition, there are many technical applications which are not so common. Some of these are described here.

Foam level control

A soap manufacturer required a control to prevent over-boiling of soap ingredients in a vat during processing. Temperature regulating controls were not suitable because chemical reactions in the liquid caused it to boil without giving off heat. And to complicate matters further, the ingredients vary with every batch.

In this process, the soap mixture is agitated by live steam and cooked by steam circulating in a jacket around the tank. A water spray is used to subdue the foam when it reaches a dangerously high level.

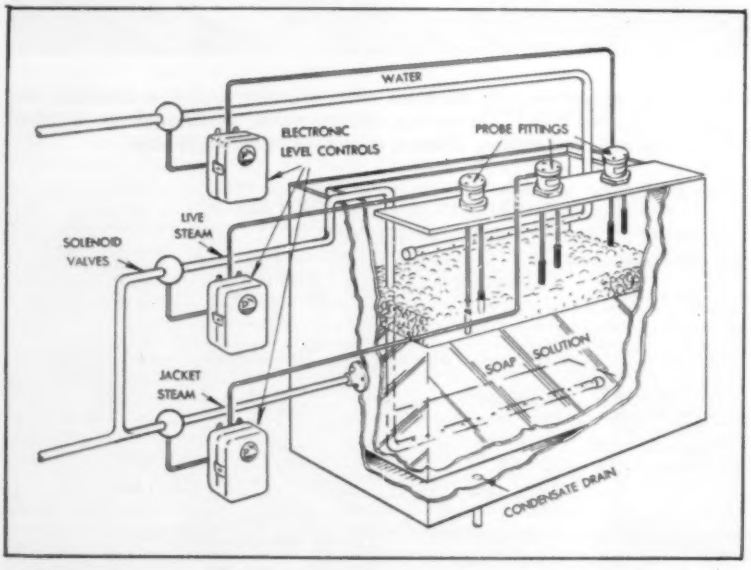
An electronic level control, which is able to sense both liquid and foam simply by contact with metal probe rods, provided the solution to the problem. A single level control and a double probe assembly are used at three critical levels. Three sets of level controls and double probe assemblies are used in conjunction with solenoid valves to separately control the live steam, jacket steam and water spray at the low, intermediate and high critical levels respectively. In each case contact of the foam with the upper probe initiates the form retarding safeguard. Dropping of the foam level below the lower probe halts the corrective action.

After the vat has been charged with the soap ingredients, the live steam and the jacket steam are turned on. When the cooking process becomes too violent, the foam level rises until it contacts the upper probe of the live steam level control, energizing this control which closes the live steam valve. If the boiling subsides sufficiently to drop the level below its lower probe, the live steam is again admitted. If the foam level continues even though the live steam is shut off, the jacket steam is shut off until the foam returns to a lower level. If the agitation still continues and the foam rises to a still higher level, a water spray is directed onto the boiling liquid. When the water spray causes the level to drop below its lower probe, the spray is shut off and the cooking process resumes. As long as the level of the foam remains below all the probes the cooking process proceeds normally; but as soon as chemical boiling action becomes too active, the controls operate as above to prevent any overflow and loss of the soap mixture.

By relieving operators for other duties, by decreasing the processing time, and by preventing messy overflows of soap liquid, this completely automatic control system resulted in impressive cost reductions.

Decontaminating showers

Many manufacturing plants use materials during some phases of processing which leave contamination on the workmen. In order to control the contamination and reduce the possibility of injury to personnel, rigid sanitary requirements are enforced. One particular manufacturing plant used materials which would endanger a worker's health if allowed to remain on clothing or the skin for any length of time. Decontamination of clothing was simple because personnel were required to wear garments provided by the manufacturer. These garments were removed and left in special rooms



Electronic level controls which can sense the difference between liquid and foam serve to prevent chemical solutions from boiling over from vats.

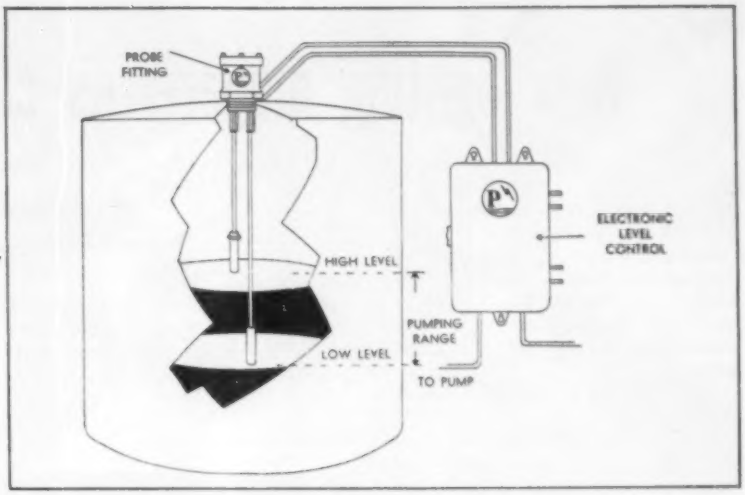
following each shift. Showers were then taken by the workers to wash off the body contamination.

A problem arose on the method of controlling the showers. If a worker should turn them on by hand, he might contaminate the faucet handles. If the showers were to run constantly, thus avoiding the handle contamination, quantities of hot water would be wasted.

The problem was solved by the use of photoelectric controls in conjunction with an electronic timer and electrically operated water valves. As a worker goes through the entrance door to the shower room, he interrupts the photoelectric control beam and the shower turns on immediately through the closed circuit of the electronic timer and the electrically operated water valves. Simultaneously, the electronic timer starts its predetermined timing cycle. Then, after the normal time for a shower has elapsed, the electronic timer shuts off the shower control valves. If other workers break the control beam while the showers are on, the timer resets and the showers continue to operate until the full timer interval for the last man has expired. Each worker is thus assured of a full shower but no water is wasted.

Should a longer or shorter shower period be desired, simple adjustment of the timer dials allows for any setting up to four minutes.

Special purpose water sprays such as foot, hand, eye or face baths can be similarly controlled.



There are many advantages to electronic control of liquid levels. Any liquid that will conduct electrical current can be controlled in this way.

Liquid level control

Liquid level controls are used throughout all industry and are particularly important in the chemical, food processing, textile, and paper fields. Electronics has contributed one of the most efficient and flexible approaches to level control.

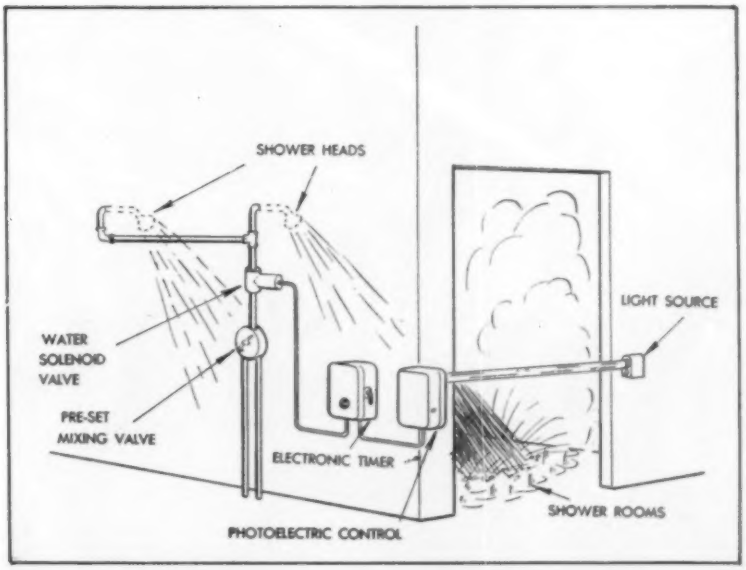
Most generally used alternate types of level controls are float switches and pressure switches. Both of these systems basically require relatively complex mechanisms in the proximity of the liquid being controlled. Float switches, for example, require mechanical linkages inside the tank. Pressure switches involve bellows seals. Both of these types of level controls are apt to call for frequent maintenance in the course of their service.

Electronic level controls are basically maintenance-free. Contact with the liquid is made only by corrosion-free metal probe rods —no moving parts are required in the tank. Accuracy is independent of temperature and pressure. These characteristics have resulted in a very extensive use of electronic level controls throughout industry and particularly in the chemical and food processing fields.

Electronic level controls can handle any liquid which is electrically conductive.

Two probe rods are suspended into the tank from a fitting attached to the top of the tank. The probe rods project into the tank to the levels at which pumping is to start and stop. The probe rods are wired to the level control. When the level of the liquid in the

(*Continued on page* 78)



Some chemical processes involve contaminating dusts and liquids and require personnel to pass through decontaminating showers. Electronic control provides a simple method of operating shower only when it is actually needed.

New lighting modernizes clothing store

by George C. Logan
Lighting Department, Tampa Electric Co.
Tampa, Fla.

◆ AN INCREASE in footcandles from 15 to 60 was the result of a recent lighting installation supervised by the Lighting Department of Tampa Electric Co., Tampa, Fla. The modernization job was done for Haber's Ladies Ready - to - Wear, Tampa store.

As evidenced by the accompanying photograph, the unsightly ceiling, with exposed sprinkler pipes and valves, not only detracted from the general appearance of the shop, but lighting fixtures were entirely inadequate to serve their intended purpose and unshielded windows created a very objectionable glare throughout the store. Lighting consisted of individual four-lamp, 40-watt unshielded fluorescent fixtures, producing 15 footcandles of illumination.

Remodeling and modernization consisted of furring down the ceiling and covering it with acoustical tile to hide the unsightly pipes. New lighting involved the installation of 24 eight-foot three-lamp, and two six-foot three-lamp fixtures and 13 highlite units recessed in the ceiling in continuous rows. Walls above the wall cases were furred out flush with the face of the cases and covered with attractive paper. New footcandle illumination averages 60.

(*Continued on page 80*)

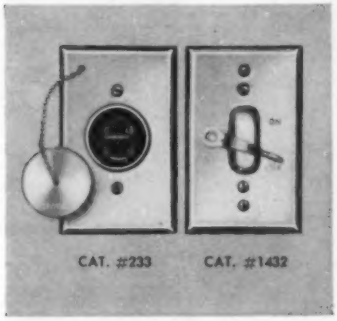
BEFORE—

AFTER—

For the modernization of Haber's out of date sales room, 24 eight-foot, three-lamp Smithcraft fixtures and 13 highlite units were installed in continuous rows on the new acoustical tile ceiling.

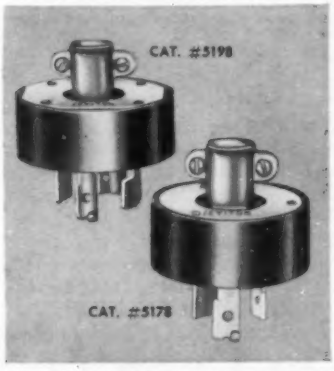
NEW PRODUCTS

Leviton Outdoor Devices Unaffected by Weather



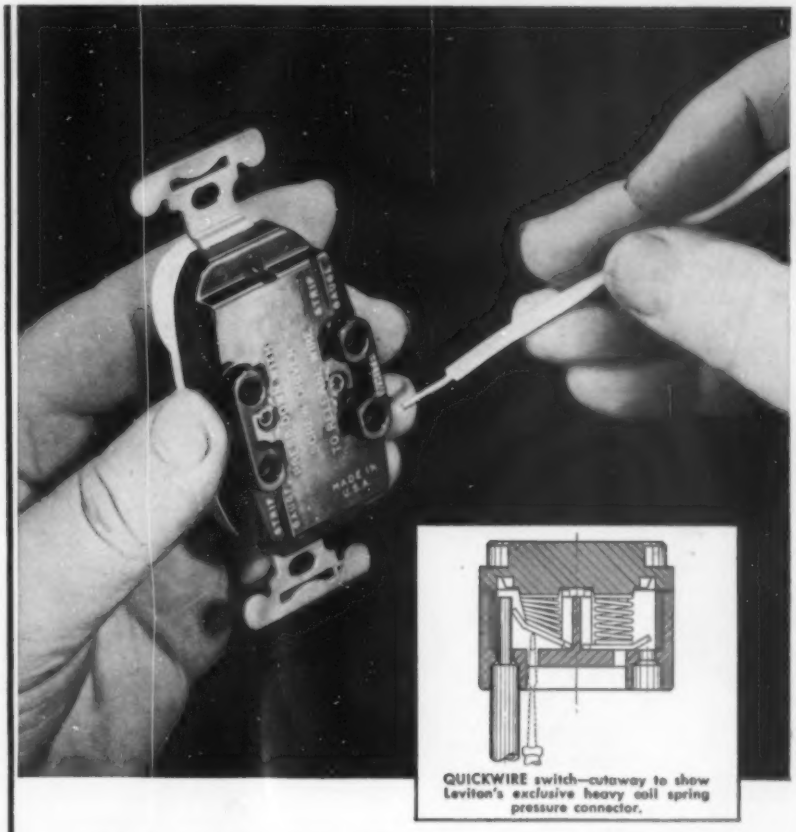
Ideal for outdoor installations — on patios, porches, garages, industrial structures — Leviton Weatherproof Switches and Receptacles offer *complete* protection against the elements. Leviton single-pole and three-way switches, for example, are fully enclosed. Each has a rubber mat behind the cover plate and is lever operated, so that operation is not affected by moisture. Receptacles have cover, on a chain, which screws into outlet when not in use. Each device individually boxed, with corrosion-resistant plate and screws included for easy installation.

LEV-O-LOCK Rubber Caps Minimize Shock and Breakage



LEV-O-LOCK Rubber Caps afford *extra* protection against shock and breakage often encountered in industrial installations. Order type 5178 caps for 20 Amp., 3 wire, or type 5198 for 20 Amp., 4 wire. Sturdy construction features assure long life; latest design makes installations fast and easy. Other famous LEV-O-LOCK devices, in bakelite, listed by the Underwriters' Laboratories, are available in 2, 3 and 4 wire, 10 and 20 amp. caps, connectors and receptacles.

For complete information write Leviton Manufacturing Company, Brooklyn 22, N. Y.



QUICKWIRE switch—cutaway to show Leviton's *exclusive* heavy coil spring pressure connector.

EASILY THE BEST!

— Quick and easy installations are done best with

NEW LEVITON Quickwire

spring type, screwless terminal switches and receptacles.

QUICK — because there are no wire loops to make, no screws to loosen and tighten. EASY — because you simply strip the wire and push it into hole. BEST — because Leviton's **exclusive** heavy coil spring connector holds the wire in place firmly, making permanent contact. To release, simply insert a screwdriver into the release hole.

You save time, money, labor costs when you use QUICKWIRE spring lock switches and receptacles. Simple, easy-to-read instructions are molded into the Bakelite on each device. Deeply recessed wire wells prevent exposure of bare wire. Fully enclosed housing, plaster ears, and handy strip gauge marking on each device.

QUICKWIRE receptacles are available in brown or ivory phenolic. Switches have either brown or ivory toggles and the same famous Leviton switch mechanism — known for service and dependability the world over. And both devices meet UL, CSA and Federal Specifications, of course.

Your best jobs are done with ... **LEVITON**

For full information write:

LEVITON MANUFACTURING COMPANY • BROOKLYN 22, N. Y.

Chicago • Los Angeles • Leviton (Canada) Limited, Montreal

For Best Results Use Wire By AMERICAN INSULATED WIRE CORPORATION

Pictured in this black and white copy of a LOOK magazine color spread are 14 new built-in appliances. Top row, left to right, wall-hung refrigerator-freezer; flush air conditioners; and washer-dryer. Second row, TV set with unpainted trim; new-type dishwasher; wall-installed electric clock; wall oven; drawer-type warming oven; built-in fan; wall heater; door chime clock; and glass-paneled oven. In the foreground is a built-in counter griddle-range.

Built-in appliances open fertile field for electrical contractors

◆ A GOOD MANY electrical contractors in the South and Southwest have been enjoying extra premium business during the past few years from the small number of built-in appliances that have been available. Many others will find it profitable to add such installations to their services as more and more manufacturers offer appliances designed to be "built-in."

Especially fruitful for new construction, built-ins are also proving lucrative in the remodeling field, and everywhere, built-ins are beginning to become accepted as the latest in "modern living."

Leaders in the electrical industry have predicted that the year 1955 will effect about the biggest change in home appliances since electricity. Having passed the try-out stage, built-ins will really arrive this year—and with famous manufacturers' name plates.

Built-ins have plenty of reason for popularity. They are custom-fitted to the most convenient working height, and dirt can't get under, behind or even beside them. They keep the neat, natural line of a room and, in their new, bright colors, add enormously to its decorative appeal.

Already universally accepted, contractors can look for built-ins to become increasingly popular. Several major manufacturers have already added a complete line of built-ins to their 1955 lines, and these new additions will be featured in their advertising.

National publications have already begun to play up the importance of built-ins. *Look* magazine in its first 1955 issue features a two page color photograph showing current models available in built-ins. The *Look* article accompanying is entitled, "1955 The 'Built-in' Year."

These new custom appliances

(*Continued on page* 79)

Ready and tagged for YOU!
WHY YOUNGSTOWN BUCKEYE CONDUIT IS BETTER
Youngstown is the one manufacturer who makes rigid steel conduit from ore to finished product. This enables Youngstown to control the complete manufacturing process—your insurance that each length of "Buckeye" is made of top-grade steel.
Call your Youngstown Distributor

Youngstown

BUCKEYE CONDUIT

QUALITY YOUNGSTOWN SERVICE

● Whenever you call your Youngstown Distributor for Youngstown Buckeye rigid steel conduit, your order is made ready and tagged for fast delivery to you. Service is quick and sure—an important factor in helping you keep your jobs on schedule. Save time and trouble — call your Youngstown Distributor next time you need good steel conduit.

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - District Sales Offices in Principal Cities

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

Financing of wiring modernization will occupy 1955 A-W conference

◆ INSTALLMENT CREDIT to spare the householder the financial pain of restyling an old-hat wiring system will be a leading concern of electrical men at their 11th Adequate Wiring Conference in Chicago, on Thursday and Friday, February 24-25, at the LaSalle Hotel.

The opening day's session is set for 10:00 A.M. John W. Evers, president, Commonwealth Edison Company, Chicago, will make the keynote address.

After a year dotted by emergence in the electrical industry of pay-as-you-go financing plans for wiring modernization, the electrical industry will spread out its experiences on a workshop drawing board and take a good look at progress so far, according to D. B. Clayton, general chairman of the conference. If better engineering and styling of these 'models' are needed, the conference is the place where changes will be born, Clayton says.

He is president of the National Electrical Contractors Association, Washington, D. C., and president and vice-president, respectively, of Electric Constructors, Inc., and Knight Electric Co., both of Birmingham, Ala.

Sponsored by NAWB

The conference has been called by the National Adequate Wiring Bureau, New York City, and will be attended by members of 80 local adequate wiring bureaus, electrical leagues and other allied groups. Approximately 300 attended last year's meeting.

Selling adequate farm wiring, the electrical dealer's promotion of A/W, the distributor's role, apartment house modernization, new residential wiring standards, and adequate wiring's appeal for consumers, are other subjects which the conference will cover.

The program, now complete in its essential details, has been announced as follows:

Thursday, Feb. 24

10:40 A. M. — What Makes Time Payment Wiring Plans Tick? Moderator, C. T. Bremicker, vice-president, sales, Northern States Power Co., Mpls., and member of the National Adequate Wiring Bureau Executive Committee. Panel: Don Willis, vice-president, sales, Arizona Public Service Co., Phoenix; Don Rosenthal, managing director, Nebraska-Iowa Electrical Council, Inc., Omaha; Charles A. Byron, residential sales manager, Conn. Light & Power Co., Berlin, Conn.; John S. McDermott, executive manager, Electric Assn. of Kansas City, Kansas City, Mo.; P. M. Rutherford, general sales manager, Dallas Power & Light Co., Dallas; Paul Brown, merchandising manager, Alabama Power Co., Birmingham, Ala.

2:00 P. M. — You've Got Me Worried, A. F. Metz, chairman of the board and chief executive officer, The Okonite Company. Mr. Metz is president of the National Electrical Manufacturers Association.

2:30 P. M. — Telling and Selling the Farm Wiring Story, Moderator, H. S. Pringle, extension agricultural engineer, electrification, U. S. Department of Agriculture, Washington, D. C. Panel: R. T. Jones, manager, farm sales, Pennsylvania Power & Light Co., Allentown; C. P. Wagner, farm electric consultant, North Central Electrical League, Minneapolis; Leo O. Stoeber, manager, Farm Electric Service Center, Bloomington, Ill.

3:30 P. M. — Dealers Promote Adequate Wiring in Portland (Ore.), Wm. Tait, manager, appliance sales promotion, Portland General Electric Co.

4:10 P. M. — Adequate Wiring, 1955, L. E. Barrett, president, National Assn. of Electrical Distributors, and chairman, Plan Committee, National Adequate Wiring Bureau.

4:40 P. M. — Presentation of LOOK Magazine merchandising and public service awards for adequate wiring campaigns based on their November article, "Watch Your Wiring."

Friday, Feb. 25

9:00 A. M. — Residential Wiring Standards Are Up, a panel of the residential wiring subcommittee, Industry Committee on Interior Wiring Design. Moderator: A. Carl Bredahl, secretary, Industry Committee; E. R. Cornish, director, research and education, National Electrical Contractors Association, Washington, D. C.; H. H. Watson, commercial engr., construction materials dept., General Electric Company, Bridgeport; John Newton, president, Oakes Electrical Supply Company, Holyoke, Mass.; Herbert Snead, supervisor, adequate wiring department, Dayton Power & Light Company, Dayton, Ohio.

10:00 A. M. — Getting Full Valuation for the 100-Ampere Service, Moderator, Roger B. Kellogg, secretary, adequate wiring committee, Electric Assn. of Chicago; panel including an electrical contractor, builder and Federal Housing Administration regional representative.

10:40 A. M. — The Distributor Takes Action, L. R. Klose II, L. R. Klose Electric Company, Kalamazoo, Michigan.

11:20 A. M. — Apartment House Wiring Modernization, J. O. Covington, manager, Consolidated Edison Adequate Wiring Bureau, New York City; T. L. Hankins, co-chairman, apartment house wiring modernization committee, Chicago Electric Association.

11:50 A. M. — Advertising Adequate Wiring to the Consumer, F. B. McKown, vice-president and assistant sales manager, Kennecott Sales Corporation, New York City.

(*Continued on page* 82)

never before an industrial with these unparalleled advantages

Patent applied for

Here's what advance design can do for you . . .

Save up to 50% on installation costs: The Uni-Race (shown above) is part of your Ortho-88. It is a rigid, lightweight, open channel-way containing a fixed power source (receptacle) for each fixture. Sections, 20-24 ft. long, are assembled and wired on the floor and hung as a unit. Fixtures, mounted without tools in minimum time, fall into perfect alignment automatically. The whole operation is accomplished easier, faster and more accurately with savings in time and materials up to 50%.

Save on materials: The amount of conduit required is reduced substantially. Receptacles, chain suspension accessories, cord and plug, etc. are completely eliminated.

Unheard-of flexibility for you: Fixtures may be mounted on the Uni-Race in continuous rows, or spaced at intervals of 4', 8' or 12'. They can be moved about, or additions made, as conditions demand without further electrical work and without interrupting service. Repairs, or replacements are made by changing fixtures without disturbing other fixtures on the circuit.

Write Today . . . for brochure giving complete details of the remarkable new Ortho-88. In addition to installation and mounting data, it illustrates several examples of how Ortho-88 versatility can work for you. Catalog pages giving complete engineering data are included.

Gibson LIGHTING

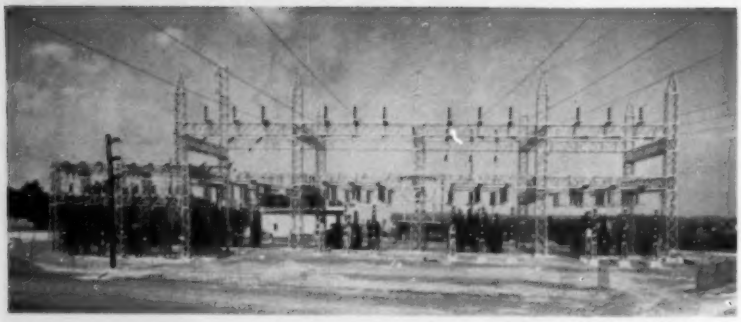
GIBSON *Manufacturing Co.*

1919 Piedmont Circle, N.E., Atlanta, Georgia

Potomac Edison's new

by Henry H. Startzman
Chief Engineer
Potomac Edison Company

and T. J. Herter
Consulting and Application Engineer
Westinghouse Electric Corp.



Potomac Edison's new Marlowe Substation, located at Marlowe, W. Va.

Interior views of the new load dispatching center at the new Potomac Edison Marlowe Substation. Symbols and diagrams on the wall board are used by the load dispatchers to control and regulate the flow of electric power around the Potomac Edison system.

◆ THE POTOMAC EDISON System's new $820,000 transmission substation and dispatching center at Marlowe, West Virginia, represents the latest step in this company's program to provide adequate facilities for supplying the ever-growing demand for electric service. The new substation is the operational nerve center for the system; from it the chief load dispatchers supervise and control transmission of power to all points on company property.

The Marlowe Substation completes a 132-kv transmission triangle of about 60 miles on each side, connecting three major generating stations. This triangle is the backbone of the Potomac Edison system, and has just recently been completely converted to 132-kv. Prior to conversion, the eastern corner of the triangle terminated at the R. Paul Smith Station, at Williamsport, Maryland; other low-voltage lines terminated there also. Because of the crowded conditions that existed at the Smith Station and the possibility of flood damage, the new transmission substation was built on high ground across the Potomac River.

Substation features

The latest developments in protective and control equipments have been utilized in the new substation. Some of the features of the substation are:

(1) High-speed circuit breaker reclosing. The 132-kv breakers are set for 20-cycle reclosing; the 34.5-kv breakers utilize time-delay reclosing.

(2) All 132-kv lines are protected by phase comparison or impedance type carrier relaying.

(3) Differential relays protect

load dispatching center

both 69/132- and 132/34.5-kv transformers.

(4) The 132- and 34.5-kv bus are protected with a linear coupler protective scheme.

(5) Short lines connecting Marlowe to the Smith Station across the river are protected with phase-comparison carrier relaying.

Transfer-trip schemes

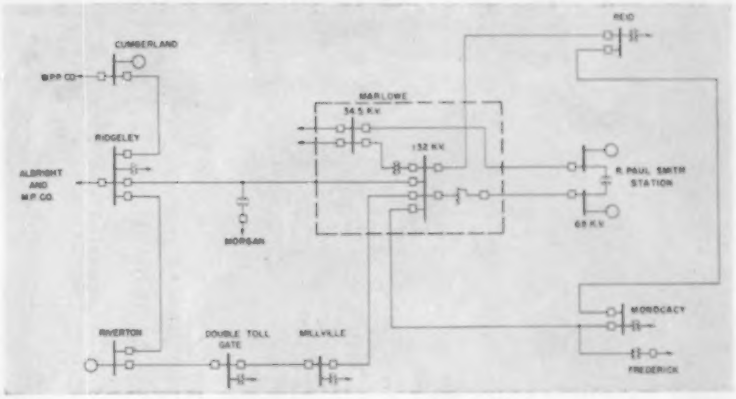
Two transfer-trip schemes have been applied on the system. One is on the Marlowe-Ridgeley line. The 53-mile line is tapped midway (Morgan) to supply the Berkley Springs district load. At this midpoint tap, a 10,000-kva transformer is applied with circuit breaker protection on the 34,500-volt side of the transformer. Since the main 132-kv transmission line feeds into Marlowe, it is impossible to set the relays of the terminal to protect the transformer and still remain within the swing characteristics of the system. Therefore, bushing-type current transformers are applied on the high-voltage side of the midpoint line-tap transformer to provide differential protection. The differential relays trip the 34.5-kv breaker locally, and by frequency-shift carrier, remotely trip the 132-kv line breakers at Ridgeley and Marlowe.

A second transfer-trip scheme is used on the short 69-kv tie line from Smith to the Marlowe Station. Protection is initiated by line relays at the Smith Station. These relays trip the 69-kv breaker at the Smith Station, and by frequency-shift carrier, transfer-trip the 132-kv breaker at Marlowe, thereby clearing the line and its associated transformer at both terminals.

Dispatching center

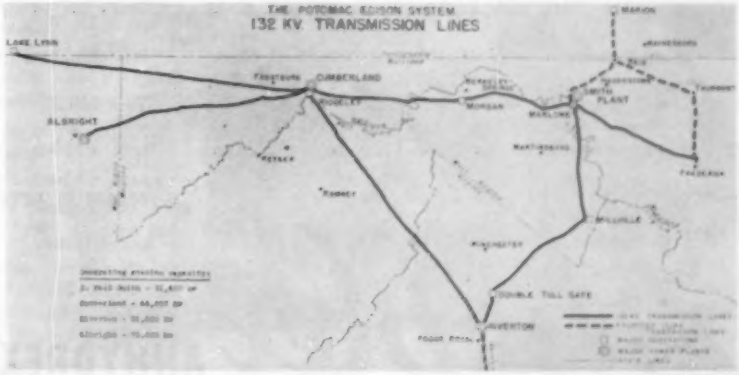
The system dispatching center is located in a building in the Marlowe Substation, approximately 55 by 64 feet. One entire inside wall of the new structure is taken up by a newly designed dispatchers' board that contains a detailed diagram of the entire

(*Continued on page 81*)

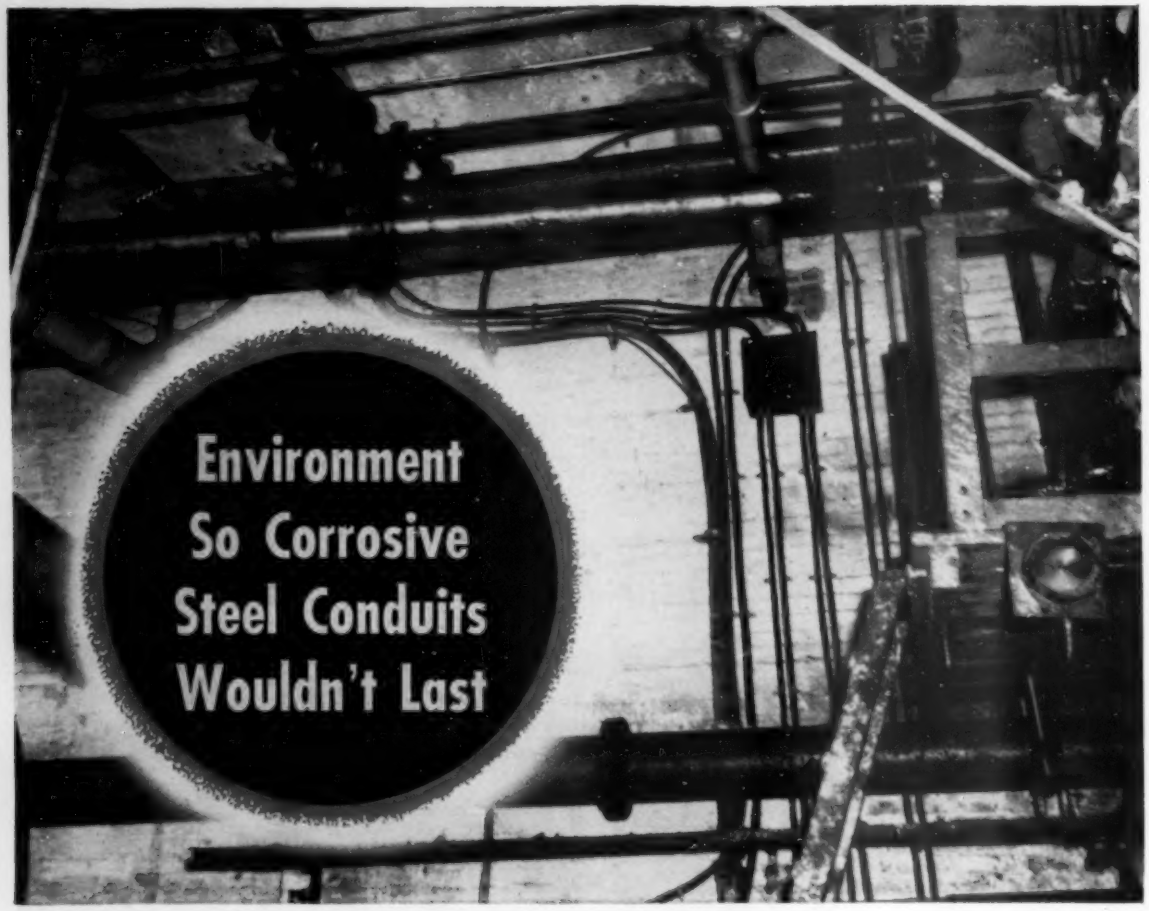


Line diagram of Marlowe Substation, which will be system headquarters.

This building houses offices and equipment of system load dispatchers who from this point control transmission over the entire company area. The various instruments necessary to supply complete communication facilities have been installed here. Tower at left is microwave tower.



Marlowe Substation, upper right in the map above, forms the final link in a 132,000-volt transmission triangle connecting generating stations at Cumberland, Riverton, and Williamsport.



Paper mills are notorious for the difficult operating conditions they pose for electrical wire and cable. Caustic soda, liquid chlorine, steam, hot water, all these and more are the daily lot of the wire and cable illustrated. Even steel conduit disintegrated in a couple of years.

That's why this paper mill in northern Maine decided to clip these Anhydrex-insulated cables directly to the walls. They knew these Simplex cables would resist the action of acids, alkalies, water and heat.

These Anhydrex-insulated cables have now been in operation for more than ten years without time off even for good behavior. Can you say the same about your power and control cables? Would you trust your present cables to operate your plant under the same conditions?

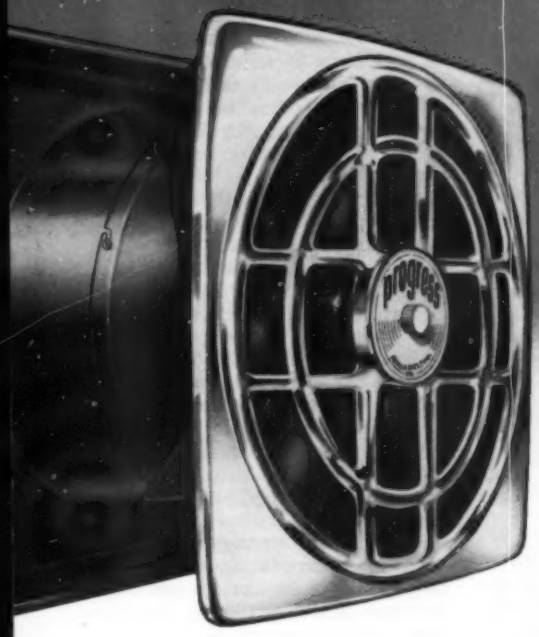
Simplex ANHYDREX-INSULATED CABLES

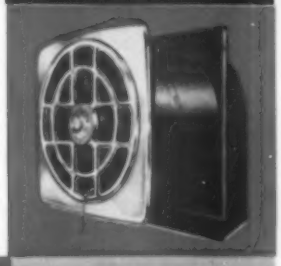
SIMPLEX WIRE & CABLE CO., 79 Sidney Street, Cambridge 39, Mass.

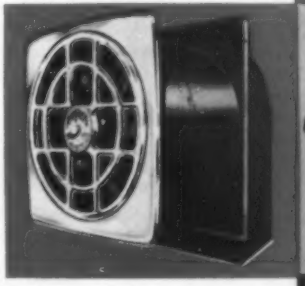
Now! progress Power Vent

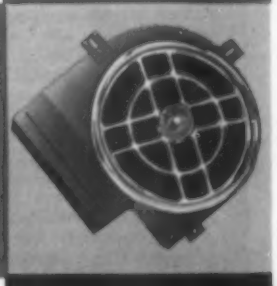
VENTILATING FANS

. . . a complete line with "years-ahead engineering" incorporating many exclusive features plus Progress' mass production know-how — to bring you a better product at a lower price.

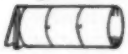








Just look at these "plus" features:



- Exclusive Progress "all-size sleeve" permits easy installation regardless of wall thickness up to 14" (And only ⅓ as much inventory to stock).
- Progress "Power-Vent" removes more air in less time.
- Striking grill design with exclusive Progress "super-chrome" or baked white enamel finish.
- Heavy gauge steel construction with exclusive Progress rust-proof outdoor finish.
- Entire grill assembly easily removed with turn of knurled thumbscrew for easy cleaning.
- Heavy-duty, kitten-quiet *motor fully guaranteed for 5 years.*

Progress POWER-VENT Fans are fully tested for plus performance both in the laboratory and on the job.

Whether your customer is planning to build . . . to rebuild . . . or to replace, there's a Progress POWER-VENT fan that's *best* for his job — and you can sell him with the same confidence that America has placed in Progress lighting fixtures for nearly half a century.

progress

WRITE FOR BULLETIN FB-55

PROGRESS MANUFACTURING CO., INC.

CASTOR AVENUE AND TULIP ST., PHILADELPHIA 34, PA.

Distribution substations

Part I

The building block approach is one concept of power system planning which allows for orderly system growth along a predetermined plan. At the same time it is flexible so as to meet changing needs and changing conditions. The building block approach is especially useful for determining distribution substation requirements to serve the new loads.

This paper will discuss the building block approach to system planning with particular emphasis on the distribution substation. The following outline lists the subjects that will be covered on the subsequent pages:

What is the Building Block Approach?—Basic Concepts of Power System Planning; System Concept Leads To Building Block Approach; Definition of the Building Block Approach.

Why Use the Building Block Approach? — Standardization; Deferring System Investment.

How To Use the Building Block Approach—Classification Into Load Types; Determination of Standards for Each Load Classification; Selection of Substation Size and Type.

Which Building Blocks To Use?

Determination of Economical Substation Size—Relationship of Substation Size With Load Density; Relationship of Substation Size With High Voltage and Low Voltage Line Cost; Relationship of Substation Size with Rate of Load Growth; Relationship of Substation Size with Geography.

Determination of Substation Type—Radial Substation; Primary Network Substation; Spot Network Substation; Low Voltage Selective Substation; Duplex Substation.

Application Comparison of Substation Types.

Economic Comparison of Substation Types.

Implementation of the Building Block Approach.

◆ WITH THE RAPID GROWTH that electric utility systems have experienced during recent years, and with continued rapid growth predicted for the years to come, adequate system planning to serve these loads is of utmost importance. Careful planning is particularly important in the distribution system, since this area contains such a large portion of total system investment.

There are two basic concepts, or ways to look at a power system, when planning for future growth. A power system can be visualized either as a collection of small individual loads with the lines and equipment necessary to serve them, or as a large system composed of these lines and equipment and serving the aggregate system load. The former concept will be designated, for the purposes of this discussion, the "load approach to power system planning," while the latter will be termed the "system approach to power system planning."

The basic objective when planning a power system is to serve present and future loads on that system as economically as possible, and at the same time provide standards of voltage and service continuity consistent with the type of loads being served. This objective is the same regardless of how one visualizes the power system. However, the system approach has certain advantages for achieving this objective. One reason why this is true will be shown by the following analogy.

Load block concept

A power system can be thought of as consisting of a very large number of blocks of varying size scattered over the area served by the system. Each block represents a load — small blocks for residential customers, larger ones for commercial, and much larger blocks for industrial loads. A number of the small blocks, contiguously located, can be grouped together to form a large block. Each of these represents a number of loads served from one distribution transformer and secondary. A number of these blocks can be combined to form one feeder. Several of these will in turn form one load area fed from a single distribution substation. The process can be repeated until all of the blocks have been combined to form a power system.

The planner knows how many blocks there are now. He also knows where they are. He can make some predictions as to where new blocks will be located five and ten years from now and how large they will be. Predictions can also be made as to how big the existing blocks will grow to be. But the accuracy of these predictions will be only fair. If instead, he forecasts the size of the larger groups of blocks five or ten years hence, the errors made in predicting the small blocks tend to average out and the over-all predictions will be more nearly accurate.

When the load concept is followed, the power system is planned starting with the smallest blocks and working upward. In order to know what the larger blocks should consist of, it is first necessary to know the characteristics of the smallest blocks with fairly good accuracy, at the earliest stages of planning. But that is difficult to do. The system concept starts with the largest blocks where greater accuracy is inherent.

When viewing a power system using the load concept, there is a tendency to think of the individual load characteristics and their differences, rather than their simi-

in system planning

by H. M. Bankus

Electric Utility Engineering Section
General Electric Company

larities. Inherently, this leads to nonuniformity in system design. The system approach emphasizes the similarities between various load areas, hence promotes standardized solutions applicable to a greater number of cases. Once standardization is accepted, the differences, when they do occur and are of sufficient importance to affect the standards of service to be provided, can be accounted for by minor modifications in the basic system design.

By promoting standardization, the system concept leads directly to a building block approach to system design. Building blocks can consist of any portion of the power system in which the design can be standardized to such an extent that additions to the system can be made in predetermined standardized units. Obviously the building block approach will have its greatest application for "equipment" such as generating units and substations, as contrasted with "lines."

Building blocks can be and have been used at a number of different levels in the power system. But in this discussion, only their application to distribution substations will be considered. When thus used, a building block will consist of a substation of standardized design and rating which can be spotted over the system wherever needed. A single unit can be installed at a feed point, or two or more units can be combined to form a larger substation at a centralized location.

Building block approach

A definition of the building block approach is now in order to summarize the previous statements, and pave the way for future discussion describing how it can be used. Stated simply, the building block approach to substation design is a method of planning and expanding a power system through use of standardized substation components.

To achieve substation standardization, substations should be predesigned and pre-engineered. The use of factory assembled unit substation type equipment provides an effective way to achieve this standardization; and at the same time relieve utility personnel of the design and engineering details. Factory assembled substations may be obtained as a complete package unit.

Standardization advantages

By definition, the building block approach and use of standardized substation components are synonymous. What, then, are the advantages of standardization that would induce one to use the building block approach?

Perhaps the most obvious advantage is interchangeability. Once the size and type of substation best adapted to a particular system has been determined, units can be ordered without regard to where they will eventually be located. Since load forecasts for large areas such as an entire system are more accurate than for the smaller subdivisions, it follows that it is easier to predict total substation needs, than the needs in any one area. If like units are purchased for all areas, one does not need to know, at the time of purchase, where each will be used.

Being interchangeable, existing substation units can readily be moved from one site to another. Thus they can be used to provide spare capacity in the event of substation failure, and can be moved in to serve rapidly increasing or temporary loads.

The second advantage of substation standardization is cost. When the installed cost of standardized substation units and tailor-made substations functionally equivalent are compared, the standardized units will usually cost less. The exact cost comparison will depend upon local labor costs. Standardized unit construction will compare best, costwise, in high cost labor areas.

Relief of engineering manpower is a third advantage. The load concept of system planning requires detailed engineering design at each stage in the plan. Since each substation is different, each must be separately designed. With the building block approach the substation suitable for a particular system can be designed once, and the engineering design decisions made will be adaptable to a large number of substations. It may not be neccessary to review these decisions for several years.

The net result is that engineering manhours are released from detailed repetitive work and can be used for designing a superior over-all system. Since engineering manhours are expensive, and since it is becoming increasingly difficult to obtain a sufficient number of engineers, better and lower cost systems result from substation standardization.

Errors less likely

A fourth advantage to standardization is that it makes construction, operation, and maintenance pratices more foolproof. Like all human beings—construction, operation, and maintenance personnel are subject to error. The less familiar the equipment with which they are working, the more true this becomes. If each substation is different, they can't be as familiar with them as if each is the same. Hence there is greater likelihood of error.

Even if all operations are made

(*Continued on page* 80)

Notes on new utility equipment

Sangamo Electric Company has announced its entry into the power capacitor field with the introduction of Sangamo Diaclor Power Capacitors. At the present time, these will be available in two standard ratings: 2400 volts, 25 kvar, and 7200 volts, 25 kvar. Diaclor is a non-inflammable stabilized liquid dielectric which operates satisfactorily at temperatures ranging from minus 40 to plus 46 degrees Centigrade.

An extended-range meter is now available from Duncan Electric Manufacturing Co., designated as the Type MK. This single-phase meter nominally rated at 15 amperes has sufficient capacity to meter continuous loads up to 100 amperes. The manufacturer reports that this extended range advantage has been attained without lowering light load performance or increase in price.

A completely redesigned line of distribution transformers has been announced by Westinghouse Electric Corp. The new transformers have improved electrical characteristics, improved sealing, fewer parts, and in the larger ratings are smaller. A new step-type core permits winding the coil closer to the core, giving a shorter mean turn in the coil. Improved tank and handhole covers and method of mounting bushings have eliminated almost 40 external bolts. Single bolt holding cover improves sealing.

Single-row capacitor racks that afford installation savings are now being offered by the Line Material Co. Designed for direct pole mounting, the new racks conserve valuable pole space, reduce bending stress on poles, and facilitate inspection and maintenance of capacitor equipment, the manufacturer reports. These racks are available as complete assemblies, switched or unswitched, and ready for immediate installation on distribution systems rated 2400 to 13800 volts. Bank sizes may be 225 or 300 kvar.

Triangle Conduit and Cable Company is now producing all of its service entrance cable with an attractive silver finish. The silver finish consists of an outer braid of glass and cotton which prevents festooning. The manufacturer reports that the new finish is cleaner to handle, better looking, and easier to strip.

The demand for a light hand tool that will produce a compression thrust of 12 tons for installing accessories on ACSR and aluminum conductor as large as 350,000 cir mils has led the Aluminum Company of America to announce such a tool for use primarily on distribution line conductors. The unit will weigh only 11 pounds and is easily operated without removing the hands from the tool handles, an advantage to workers installing wiring at pole tops or in cramped places. The unit will be available with or without insulated body and handles, and it may be used with hot sticks.

Plastic bags for distribution transformers is the latest innovation at General Electric Company's plants at Pittsfield and Holyoke, Mass. The bags are placed over the transformers before crating and help protect transformer finish while units are stored for long periods in utility storage yards. The manufacturer points out that distribution transformers are often subjected to harder wear while in storage than they would be in service.

Rome Cable Corporation has introduced a new type of non-metallic sheathed cable designed especially for 5 kv power feeder service. A polyvinyl-chloride sheath and polyethylene insulating compound result in a cable of smaller diameter, which results in lower installation costs, and at the same time provides better resistance to chemicals, moisture and mechanical damage and wear.

"Load Tap Changing Equipment" is the title of a new bulletin now available from Moloney Electric Co. This 30-page booklet is designated LTC-2907.

A new line of malleable iron straight line clamps is available from Porcelain Insulator Corp. The principal advantages of the modified design are easy blanketing and increased gripping surface on the conductor. Also each clamp will accommodate a wider range of conductors.

You can increase production at night by using Crouse-Hinds Floodlights to

"turn night-time into day-time"

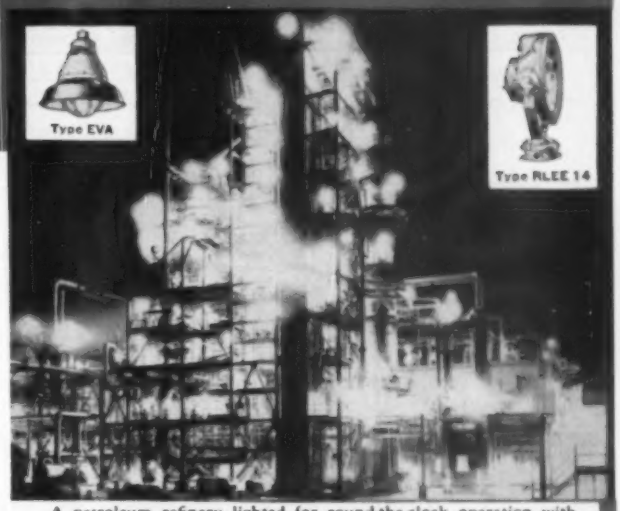
Production curves go up when Crouse-Hinds high efficiency floodlights are installed in yards and approaches to industrial plants.

The usefulness of many outdoor areas can be multiplied by flooding them with controlled illumination. Crouse-Hinds all-inclusive line with short, medium, and long range projectors makes it possible to get the right amount of light at the locations where it is needed. This control insures the clarity of daylight where it will do the most good, without wasteful over lighting of unused areas.

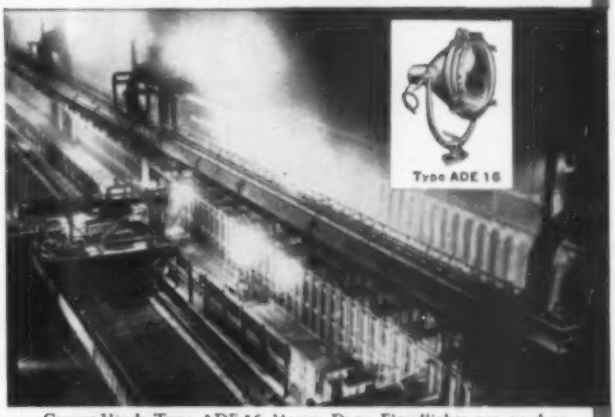
Frequently it will cost much less to project light a considerable distance with Crouse-Hinds long range floodlights than to run cable and install local lighting. There are also indoor locations in large buildings where floodlights are the most economical and satisfactory source of light.

Plenty of light is also the most reliable and cheapest form of protection against night prowlers. Sabotage and pilferage thrive in darkness. Crouse-Hinds floodlights project powerful beams of light that bathe all approaches to your property with glaring radiance, compelling everyone to be more visible than in broad daylight.

A Crouse-Hinds floodlighting installation pays off in: (1) increased production; (2) prevention of accidents; (3) protection against dangerous prowlers. Pioneers in floodlighting, Crouse-Hinds illumination engineers have accumulated a wealth of lighting knowledge that is at your service. Write for additional information and ask for your FREE copy of Crouse-Hinds Bulletin 2672 "Lighting Equipment". It contains listings of hundreds of types and sizes of floodlights and explosion-proof, dust-tight, and vaportight industrial lighting fixtures.



A petroleum refinery lighted for round-the-clock operation with Crouse-Hinds Type EVA Explosion-Proof and Raintight Industrial Lighting Fixtures, and Type RLEE-14 Explosion-Proof Floodlights.



Crouse-Hinds Type ADE-16 Heavy Duty Floodlights are used to "turn night-time into day-time" at this plant for 24-hour production.

A parking lot efficiently lighted by Crouse-Hinds Type FLA General Purpose Floodlights.

CROUSE-HINDS COMPANY
Syracuse 1, N. Y.

OFFICES: Amarillo — Birmingham — Boston — Buffalo — Chicago — Cincinnati — Cleveland Dallas — Denver — Detroit — Houston — Indianapolis — Kansas City — Los Angeles — Memphis Milwaukee — New Orleans — New York — Philadelphia — Pittsburgh — Portland, Ore. San Francisco — Seattle — St. Louis — St. Paul — Tulsa — Washington.
RESIDENT REPRESENTATIVES: Albany — Atlanta — Baltimore — Baton Rouge — Charlotte Chattanooga — Corpus Christi — Reading, Pa. — Richmond, Va. — Shreveport
Crouse-Hinds Company of Canada, Ltd., Toronto, Ont.

FLOODLIGHTS · AIRPORT LIGHTING · TRAFFIC SIGNALS · CONDULETS

NO. OF CABLES PULLED, 1 & 2

LEAD SHEATHED CABLE (IN CONDUIT)
ONE CONDUCTOR

CABLE SIZE	HRS."M". FT.	LABOR COST INSTALLED PER FT. AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
12	5.5	.0069	.0083	.0096	.011	.0124	.0138	.0151	.0165	.0179	.0193	.0206
10	8.6	.0108	.0129	.0151	.0172	.0194	.0215	.0237	.0258	.028	.0301	.0323
8	10.1	.0126	.0152	.0177	.0202	.0227	.0253	.0278	.0303	.0328	.0354	.0379
6	13.9	.0174	.0209	.0243	.0278	.0313	.0348	.0382	.0417	.0452	.0487	.0521
4	17.7	.0221	.0266	.031	.0354	.0398	.0443	.0487	.0531	.0575	.062	.0664
2	25.0	.0313	.0375	.0438	.050	.0563	.0625	.0688	.075	.0813	.0875	.0938
1	27.6	.0345	.0414	.0483	.0552	.0621	.069	.0759	.0828	.0897	.0966	.104
1/0	32.1	.0401	.0482	.0562	.0642	.0722	.08	.0883	.0963	.104	.112	.12
2/0	36.5	.0456	.0548	.0639	.073	.0821	.091	.10	.11	.119	.128	.137
3/0	40.8	.051	.0612	.0714	.0816	.0918	.102	.1122	.1224	.1326	.1428	.153
4/0	47.7	.0596	.0716	.0835	.0954	.1073	.1193	.1312	.1431	.155	.167	.1789
250 MCM	52.7	.0659	.0791	.0922	.1054	.1186	.1318	.1449	.1581	.1713	.1845	.1976
300 "	59.3	.0741	.089	.1038	.1186	.1334	.1483	.1631	.1779	.1927	.2076	.2224
350 "	64.5	.0806	.0968	.1129	.129	.1451	.1613	.1774	.1935	.2096	.2258	.2419
400 "	69.7	.0871	.1046	.122	.1394	.1568	.1743	.1917	.2091	.2265	.244	.2614
500 MCM	78.5	.0981	.1178	.1374	.157	.1766	.1963	.2159	.2355	.2551	.2748	.2944
600 "	85.8	.1073	.1287	.1502	.1716	.1931	.2145	.236	.2574	.2789	.30	.3218
700 "	92.6	.1158	.1389	.1621	.1852	.2084	.2315	.2547	.2778	.301	.3241	.3473
750 "	95.8	.1198	.1437	.1677	.1916	.2156	.2395	.2635	.2874	.3114	.3353	.3593
800 MCM	97.1	.1239	.1487	.1734	.1982	.223	.2478	.2725	.2973	.322	.3469	.3716
900 "	104.2	.1303	.1563	.1824	.2084	.2345	.2605	.2866	.3126	.3387	.3646	.3908
1000 "	109.5	.1369	.1643	.1916	.219	.2464	.2738	.3011	.3285	.3559	.3833	.4106

LABOR: INCLUDES PULLING, (NO TAPS). ADD FOR TRUCK OR WINCH RENTAL. PULL WIRE IN PLACE.

NO CABLES PULLED 3 AND 4

LEAD SHEATHED CABLE (IN CONDUIT)
ONE CONDUCTOR

CABLE SIZE	HRS."M" FT.	LABOR COST INSTALLED PER FT. AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
12	6.1	.0076	.0092	.0107	.0122	.0137	.0153	.0168	.0183	.0198	.0214	.0229
10	9.5	.0119	.0143	.0166	.019	.0214	.0238	.0261	.0285	.0309	.0333	.0356
8	11.1	.0139	.0167	.0194	.0222	.025	.0278	.0305	.0333	.0361	.0389	.0416
6	15.3	.0191	.023	.0268	.0306	.0344	.0383	.0421	.0459	.0497	.0536	.0574
4	19.5	.0244	.0293	.0341	.039	.0439	.0488	.0536	.0585	.0634	.0683	.0731
2	27.5	.0344	.0413	.0481	.055	.0619	.0688	.0756	.0825	.0894	.0963	.1031
1	30.4	.038	.0456	.0532	.0608	.0684	.076	.0836	.0912	.0988	.1064	.114
1/0	35.3	.0441	.053	.0618	.0706	.0794	.0882	.0971	.1059	.1147	.1236	.1324
2/0	40.2	.0503	.0603	.0704	.0804	.0905	.1005	.1106	.1206	.1307	.1407	.1508
3/0	44.9	.0561	.0674	.0786	.0898	.101	.1123	.1235	.1347	.1459	.1572	.1684
4/0	52.5	.0656	.0788	.0919	.105	.1181	.1313	.1444	.1575	.1706	.1838	.1969
250 MCM	58.0	.0725	.087	.1015	.116	.1305	.145	.1595	.174	.1885	.203	.2175
300 MCM	65.2	.0815	.0978	.1141	.1304	.1467	.163	.1793	.1956	.2119	.2282	.2445
350 MCM	71.0	.0888	.1065	.1243	.142	.16	.1775	.1953	.213	.2308	.2485	.2663
400 MCM	76.7	.0959	.1151	.1342	.1534	.1726	.1918	.2109	.23	.2493	.2685	.2876
500 MCM	86.4	.108	.1296	.1512	.1728	.1944	.216	.2376	.2592	.2808	.3024	.324
600 MCM	94.4	.118	.1416	.1652	.1888	.2124	.236	.2596	.2832	.3068	.3304	.354
700 MCM	101.9	.1274	.1529	.1783	.2038	.2293	.2548	.2802	.3057	.3312	.3567	.3821
750 MCM	105.4	.1318	.1581	.1845	.2108	.2372	.2635	.2899	.3162	.3426	.3689	.3953
800 MCM	109.0	.1363	.1635	.1908	.218	.2453	.2725	.2998	.327	.3543	.3815	.4088
900 MCM	114.6	.1433	.1719	.2006	.2292	.2579	.2865	.3152	.3438	.3725	.4011	.4298
1000 MCM	120.4	.1505	.1806	.2107	.2408	.2709	.301	.3311	.3612	.3913	.4214	.4515

LABOR: INCLUDES PREPARATION, PULLING AND LOSS TIME (NO TAPS), PULL WIRE IN PLACE, ADD FOR TRUCK OR WINCH RENTAL.

Estimating tabulations published by special permission from "Blue Book of Electrical Estimating," published by Estimating Handbooks Associates, DeKalb, Illinois. Copyright 1953 by Geo. L. Sherlock.

YOU MAKE PROFITS GROW WHEN YOU MAKE MINUTES COUNT

Just what is profit?

Simply stated, it's what you have left *after* you pay for materials AND labor.

Material costs are generally constant. It's TIME that makes the difference! And, that's one of the big differences—all in your favor—you'll find in Day-Brite fixtures. They're engineered to save your installation time—to help you make a bigger profit! That's the actual on-the-job experience of thousands of electrical contractors all over the United States.

Think of this, too: The time you save on one job enables you to move on faster to the next—where you'll again save more time when you install Day-Brite fixtures. And, of course, again make more profit! ... Remember, also, that every Day-Brite job is a job well done—it fully backs you up in building a reputation that leads to added business and added profits!

This is not just "sales talk"—you can prove it if you SEE, EXAMINE and COMPARE Day-Brite installation costs with those of other fixtures.

A FEW DAY-BRITE TIMESAVERS THAT HELP YOU MAKE DOLLARS OUT OF MINUTES

TIMESAVING ADJUSTABLE "A-J*" HANGER... Reduce installation time on hard-to-work with, uneven ceilings. Swivel fitting and 1⅛" hand-operated vertical adjustment let you lay in your fixture run, trim it up later... No field assembly of screws, bolts or locknuts is required. "A-Js" give you a quick, simple, foolproof way to save time and increase profit.

*PATENT NO. 2446736
UNDERWRITERS APPROVED. TM REG. U.S. PAT. OFF.

TIMESAVING HYDEE HANGER**... Easy, low-cost way to hang chain-suspended fixtures. Connect wires to receptacle—fits standard 4" or 3¼" outlet box or plaster ring... Screw hanger to outlet box—only two screws needed. No centering, no punching, no drilling. Screwdriver only tool needed... Hang the fixture and plug it in—that's all! ... Use Hydees—save time, increase profit!

**PATENT NO. D-141024 AND NO. 440814.
UNDERWRITERS APPROVED. TM REG. U.S. PAT. OFF.

OTHER TIMESAVING DAY-BRITE FITTINGS

Sliding Clamp Hanger Fittings... Twin-stem Hangers (8"and 24" lengths) ... Ice-Tong Hanger Clamps.

Day-Brite Lighting, Inc., 5435 Bulwer Ave., St. Louis 7, Mo.... In Canada, Amalgamated Electric Corp., Ltd., Toronto 6, Ont.

SEE YOUR DAY-BRITE DISTRIBUTOR

"DECIDEDLY BETTER"
DAY-BRITE
Lighting Fixtures

5412

NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMENT

REMOVING CONDUCTORS FROM CONDUIT
BASED ON 3 CONDUCTORS PER L.F. CONDUIT

WIRE SIZE	HRS. PER 100 L.F. 3 W.	REMOVAL COST PER L.F. AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
14	1.3	.0163	.0195	.0228	.026	.0293	.0325	.0358	.039	.0423	.0455	.0488
12	1.5	.0188	.0225	.0263	.03	.0338	.0375	.0413	.045	.0488	.0525	.0563
10	1.9	.0238	.0285	.0333	.038	.0428	.0475	.0523	.057	.0618	.0665	.0713
8	2.6	.0325	.039	.0455	.052	.0585	.065	.0715	.078	.0845	.091	.0975
6	3.2	.04	.048	.056	.064	.072	.08	.088	.096	.104	.112	.12
4	4.1	.0513	.0615	.0718	.082	.0923	.1025	.1128	.123	.1333	.1435	.1538
2	5.2	.065	.078	.091	.104	.117	.13	.143	.156	.169	.182	.195
1	5.8	.0725	.087	.1015	.116	.1305	.145	.1595	.174	.1885	.203	.2175
1/0	6.8	.085	.102	.119	.136	.153	.17	.187	.204	.221	.238	.255
2/0	7.4	.0925	.111	.1295	.148	.1665	.185	.2035	.222	.2405	.259	.2775
3/0	7.8	.0975	.117	.1365	.156	.1755	.195	.2145	.234	.2535	.273	.2925
4/0	8.5	.1063	.1275	.1488	.17	.1913	.2125	.2338	.255	.2763	.2975	.3188
250 MCM	8.9	.1113	.1335	.1558	.178	.2003	.2225	.2448	.267	.2893	.3115	.3338
300 MCM	9.3	.1163	.1395	.1628	.186	.2093	.2325	.2558	.279	.3023	.3255	.3488
350 MCM	10.2	.1275	.153	.1785	.204	.2295	.255	.2805	.306	.3315	.357	.3825
400 MCM	10.5	.1313	.1575	.1838	.21	.2363	.2625	.2888	.315	.3413	.3675	.3938
500 MCM	11.2	.14	.168	.196	.224	.252	.28	.308	.336	.364	.392	.42
600 MCM	11.7	.1463	.1755	.2048	.234	.2633	.2925	.3218	.351	.3803	.4095	.4388
700 MCM	12.5	.1563	.1875	.2188	.25	.2813	.3125	.3438	.375	.4063	.4375	.4688
750 MCM	13.4	.1675	.201	.2345	.268	.3015	.335	.3685	.402	.4355	.469	.5025
800 MCM	14.7	.1838	.2205	.2573	.294	.3308	.3675	.4043	.441	.4778	.5145	.5513
900 MCM	15.6	.195	.234	.273	.312	.351	.39	.429	.468	.507	.546	.585
1000 MCM	16.4	.205	.246	.287	.328	.369	.41	.451	.492	.533	.574	.615

LABOR: REMOVAL OF CONDUCTOR ONLY.

Estimating Forms—Page 3

MANY ESTIMATORS prefer to design their own forms for home wiring estimates, taking into account specific characteristics of their organization and specialties. For those contractors handling a considerable volume of home wiring, these forms will generally be designed to record the necessary data in either one of two general ways.

One method is based on the unit outlet method. This method involves the development of average labor costs for all the work associated with the installation of a single type of outlet, including the installation of an average length of circuit to serve the outlet. To this labor cost for installation, there must be added the cost of the materials involved for the outlet.

For example, consider a ceiling light outlet in a residence being wired with armored cable. Materials required would include an outlet box, box support, box cover, 2 cable connectors, a length of 2-wire armored cable, and such miscellaneous items as may be required. The length of cable to be included with each outlet will depend upon experience and predominating type of construction as well as average size of rooms. For the average type of dwelling, it will be found that 12 to 15 feet of cable will be an average requirement. In those areas where local inspection fees are based upon specific charges per outlet, the electric permit fee should be added in to the cost per outlet.

In using this method, the estimator will accumulate data and prepare tables for each different type of outlet, such as ceiling light outlet, wall light outlet, switch outlet, wall receptacle, etc., and for each of these different type of outlets he will have the labor time required to make the installation. By applying labor rates to the time, and unit cost of materials to the quantity of materials required, he arrives at the total cost per unit for installing each particular type of outlet. The total cost of the job, of course, is obtained by making a take off of the plans to get the total number of each type of outlet, and then applying the total unit cost for each type of outlet to the total number of that type.

In preparing the basic data, the estimator generally works up tables of unit costs for various types of construction such as armored cable, non-metallic sheathed cable, thin wall conduit, etc. The labor time for each type outlet can be obtained from analyzing time sheets of completed jobs for various types of construction, but material costs may have to be revised from time to time as prices change.

The basic costs mentioned above are the contractor's actual costs for labor and materials and do not include his overhead costs and profit. He will apply such factors as will be required to convert these actual costs to selling prices.

Estimating tabulations published by special permission from "Blue Book of Electrical Estimating," published by Estimating Handbooks Associates, DeKalb, Illinois. Copyright 1953 by Geo. L. Sherlock.

The Magazine

for

Southern

Electrical Men

Is

ELECTRICAL SOUTH

◆

MAKE USE
of our
READER SERVICE

The editorial and business staff of **Electrical South** is eager to serve you. One way in which we can help you is to make it easy for you to draw upon the wealth of technical and promotional material available from manufacturers.

In the accompanying pages are the descriptions of scores of useful catalogs, application information booklets, and technical publications. These are available without charge.

Check over the list of publications available, circle the numbers of the ones you need, and mail the coupon to us with your name, title, company and address plainly written. We will tell each manufacturer to send directly to you the information you want.

Porcelain Products' service mast KIT

Everything furnished

but the house and conduit

for
Ranch type homes

Available Now!—a Service Entrance Mast kit complete to every detail—including roof flashing. Even necessary bolts, nuts, lag screws, and nails. These articles make up the new Porcelain Products' service mast kit that you'll put up and forget. All components of the kit can be *installed by an electrician, with electricians' tools.*

Here is a list of the parts:

- ✓ **1¼" UL approved Service Entrance Cap**
- ✓ **1¼" to 2" Bell Reducer to adapt service cap to conduit**
- ✓ **Galvanized Roof Flashing and Storm Collar**
- ✓ **Roof Mounting Plate of new and original design**
- ✓ **Conduit hanger with 2¼" lag screw attached**
- ✓ **Slip-fitting offset reducer with interior grounding device**
- ✓ **All necessary bolts, nuts, lag screws and nails**
- ✓ ***Plus*—Porcelain Products famous 2061-C Pipe Mounting house brackets as specified.**

Write for details today!

61 years **Porcelain Products, Inc.** **PP INC.**
FINDLAY, OHIO

ELECTRICAL ASSOCIATION DIRECTORY FOR THE SOUTH AND SOUTHWEST

Electric Institute of Washington. William G. Hills, Managing Director, 10th and E Sts., Washington, D. C.

Electrical Clearing House of Louisville, Inc. W. D. Roach, Secretary-Treasurer, 731 W. Ormsby Ave., Louisville 3, Ky.

Electrical Association of New Orleans. E. H. Mowen, Secretary, 921 Union St., New Orleans, La.

Peninsula Electrical Association. J. Russell Hopkins, Secretary, c/o Central Electrical Supply Co., Salisbury, Md.

The Electric Association of Kansas City. John S. McDermott, Executive Manager, Merchandise Mart Bldg., Kansas City 8, Mo.

St. Louis Electrical Board of Trade. Carl H. Christine, Secretary-Manager, 1221 Locust St., St. Louis 3, Mo.

Electric League of Chattanooga. Paul J. McMillian, Secretary, Sixth and Market Sts., Chattanooga 2, Tenn.

Electrical League of Norfolk. C. R. Hegamyer, Secretary-Treasurer, P. O. Box 605, Norfolk 1, Va.

Electrical Association of Richmond, C. F. Bennett, Executive Secretary, 205 West Grace St., Richmond 20, Va.

The Electric League of Charleston. Guilford C. Smith, Secretary-Treasurer, c/o Appalachian Electric Power Co., P. O. Box 1986, Charleston 27, W. Va.

Central West Virginia Electrical League, Inc. J. R. Waters, Secretary, P. O. Box 1392, Fairmont, W. Va.

UTILITIES

Southeastern Electric Exchange. John W. Talley, Managing Director, 303 Haas-Howell Bldg., Atlanta, Ga.

The Maryland Utilities Association. Robert L. Smith, Secretary, Frederick, Md.

Oklahoma Utilities Association. Kate A. Niblack, Secretary, Suite 2415, Oklahoma Biltmore Hotel, Oklahoma City 2, Okla.

Public Utilities Association of the Virginias. R. W. McKinnon, Executive Secretary, 5 Franklin Rd., SW, Roanoke 11, Va.

WHOLESALERS

Southeastern Electrical Wholesalers Association. M. L. Tice, Executive Vice-President, P. O. Box 176, Ben Hill, Ga.

National Association of Electrical Distributors. Arthur W. Hooper, Executive Director, 290 Madison Ave., New York 17, N. Y.

REPRESENTATIVES

Southeastern Electrical Manufacturers Representatives Club. Frank P. Bell, Secretary-Treasurer, 806 Peachtree St., NW, Atlanta 3, Ga.

Electrical Manufacturers Representatives Association, Inc. W. N. Chenoweth, Secretary, P. O. Box 75, Riderwood, Md.

Electrical Manufacturers' Representatives of Virginia, Inc. C. F. Bennett, Secretary, 205 West Grace St., Richmond 20, Va.

CONTRACTORS

Florida Association of Electrical Contractors. L. L. Dick, State Manager, 620 Stovall Professional Bldg., Tampa 2, Fla.

Association of Independent Electrical Contractors. R. E. Neumann, Secretary, 704 Frenchmen St., New Orleans 16, La.

Electrical Contractors Association of Maryland. Charles L. Greer, Secretary-Treasurer, 404 North High St., Baltimore, Md.

National Electrical Contractors Association. Clint J. Harder, Secretary-Treasurer, 1200 18th St., NW, Washington 6, D. C.

NECA, Birmingham Chapter. Ernest W. Weir, Manager, P. O. Box 1781, Birmingham, Ala.

NECA, Gulf Coast Chapter. Ernest E. Smith, Manager, 402 St. Michael St., Box 1003, Mobile, Ala.

NECA, Central Alabama Chapter. C. A. Dart, Manager, 212 Hunter Lane, Montgomery, Ala.

NECA, Arkansas Chapter. Earl G. Fisk, Manager, 904 Center St., Little Rock, Ark.

NECA, Washington, D. C. Chapter. Harry W. Kellams, Manager, 910 17th St., NW, Washington 6, D. C.

NECA, Atlanta Chapter. George L. Peterson, Manager, 709-711 Peters Bldg., Atlanta, Ga.

NECA, Southeastern Industrial Chapter. K. D. White, 946 W. Peachtree St., NW, Atlanta, Ga.

NECA, South Georgia Chapter. R. A. Kobs, Manager, 3208 Hamilton Rd., Columbus, Ga.

NECA, North Florida Chapter. W. S. Binckley, Manager, P. O. Box 3172, Jacksonville, Fla.

NECA, South Florida Chapter. Charles J. Powers, Manager, 2607 Flagler St., Miami 36, Fla.

NECA, Kansas Chapter. Charles W. Paige, Manager, 416 Central Bldg., Topeka, Kan.

NECA, Central Kentucky Chapter. Clair W. Stille, Manager, 137 Bassett Ave., Lexington 27, Ky.

NECA, Louisville Chapter. J. C. Snyder, Manager, 120 East Brandies St., Louisville 8, Ky.

NECA, Louisiana Chapter. George A. Seaman, Acting Manager, 1642 Convention St., Baton Rouge, La.

NECA, South Louisiana Chapter. Rudolph Viener, Jr., Manager, 831 St. Peter St., New Orleans 16, La.

NECA, North Louisiana Chapter. F. J. Evans, Manager, 753 Dalzell St., P. O. Box 1210, Shreveport, La.

NECA, Maryland Chapter. Robert L. Higgins, Manager, American National Bldg., Room 305, 204 North Liberty St., Baltimore 1, Md.

NECA, North Mississippi Chapter. Woodrow C. Bryan, Manager, 4634 Cedarhurst Drive, Jackson, Miss.

NECA, Greater Kansas City Chapter. J. A. Scheffer, Manager, 2201 Grand Ave., Kansas City 8, Mo.

NECA, St. Louis Chapter. R. E. Vierheller, Manager, 611 Olive St., St. Louis 1, Mo.

NECA, Carolinas Chapter. D. L. Casey, Manager, P. O. Box 4056, Charlotte 4, N. C.

NECA, Western Oklahoma Chapter. Tom M. Rushing, Manager, 704½ North Broadway, Oklahoma City 2, Okla.

NECA, East Oklahoma Chapter. Horace Y. Strader, Manager, 111 South Norfolk St., Tulsa, Okla.

NECA, Chattanooga Chapter. W. C. Harris, Manager, 402 Chattanooga Bank Bldg., Chattanooga 2, Tenn.

NECA, Knoxville Chapter. W. G. Hoffman, 312 West Jackson Ave., Knoxville 24, Tenn.

NECA, Memphis Chapter. Raymond Calhoun, Manager, 215 Madison Ave., Memphis 3, Tenn.

NECA, Nashville Chapter. G. Paul Crowder, Manager, 115 16th Ave., North, Nashville, Tenn.

NECA, Panhandle Chapter. John H. Burt, Manager, P. O. Box 2283, Amarillo, Tex.

NECA, Central Texas Chapter. Tom Clawson, Manager, P. O. Box 881, Austin, Tex.

NECA, Texas Gulf Coast Chapter. Ray R. Hayes, Manager, P. O. Box 2049, Corpus Christi, Tex.

NECA, Northeast Texas Chapter. L. E. Martin, Manager, 1923 McKinney Ave., Dallas 1, Tex.

NECA, El Paso Chapter. John E. Blaine, Manager, 310 San Francisco St., El Paso, Tex.

NECA, North Texas Chapter. C. E. Wann, Manager, Westchester House, Apt. 102, 554 South Summit, Fort Worth, Tex.

NECA, Southeast Texas Chapter. Charles Scholibo, Manager, 1100 Richmond Ave., Houston 6, Tex.

NECA, East Texas Chapter. Harry L. Wren, Manager, P. O. Box 1226, Kilgore, Tex.

NECA, West Texas-New Mexico Chapter. Edward Strout, Manager, 105 College Ave., P. O. Box 121, Lubbock, Tex.

NECA, South Texas Chapter. Frank R. Stewart, Manager, 774 East Locust St., San Antonio 12, Tex.

NECA, Rio Grande Valley Chapter. R. N. Cummings, Manager, 607 West 4th St., Weslaco, Tex.

NECA, Virginia Chapter. Richard R. Smouse, Manager, 6916 Horsepen Rd., Richmond 26, Va.

NECA, West Virginia-Ohio Valley Chapter. James E. Swan, Manager, 510½ C St., South Charleston, W. Va.

INSPECTORS

IAEI, Alabama Chapter. Hugh Roberts, Secretary-Treasurer, Alabama Power Co., 600 North 18th St., Birmingham, Ala.

IAEI, Florida Chapter. R. H. Wellwood, Secretary-Treasurer, 2605 11th Ave., NW, Bradenton, Fla.

IAEI, Georgia Chapter. W. S. Smith, Jr., Secretary, 713 Broad St., Augusta, Ga.

IAEI, Kentucky Chapter. E. H. Rueppel, Secretary-Treasurer, 201 Citizens Bldg., Louisville 2, Ky.

IAEI, George Weiman Chapter. J. Clifton Young, Secretary-Treasurer, 317 Baronne St., New Orleans 9, La.

IAEI, North Louisiana-East Texas Chapter. P. R. Reitzammer, Secretary-Treasurer, Commercial Bldg., Room 3, Shreveport, La.

IAEI, Mississippi Chapter. C. B. Grauer, Secretary-Treasurer, P. O. Box 1790, Jackson, Miss.

IAEI, Missouri-Kansas Chapter. T. McGinnis, Secretary-Treasurer, City Hall, Topeka, Kan.

IAEI, St. Louis Chapter. Neil W. Butteiger, Secretary-Treasurer, 7427 Canton Ave., University City 14, Mo.

IAEI, North Carolina Chapter. C. S. Whitaker, Secretary-Treasurer, City Hall, Durham, N. C.

IAEI, South Carolina Chapter. N. R. Darling, Secretary-Treasurer, P. O. Box 390, Columbia, S. C.

IAEI, Tennessee Chapter. R. E. Ward, Div. of Fire Prevention, 102 State Office Bldg., Nashville 3, Tenn.

IAEI, Texas Chapter. R. L. Payne, Secretary-Treasurer, 3303 Schley St., Dallas, Tex.

IAEI, Texas Gulf Coast Chapter. M. W. McRaven, Secretary-Treasurer, P. O. Box 1700, Houston 1, Tex.

IAEI, Southern Section. A. M. Miller, Secretary, 910 West 30th St., Richmond 25, Va.

IAEI, Virginia Chapter. A. M. Miller, Secretary-Treasurer, 910 West 30th St., Richmond 25, Va.

IAEI, West Virginia Chapter. H. L. Parks, Secretary-Treasurer, P. O. Box 626, Charleston, W. Va.

MOTOR REPAIR SHOPS

National Industrial Service Association, Inc. Fred B. Wipperman, Executive Secretary, 818 Olive St., St. Louis 1, Mo.

NISA, Southeastern Chapter. M. E. Assalone, Secretary, 235 NW 2nd Ave., Miami 36, Fla.

NISA, Electric Motor Service Association of the District of Columbia. John W. Lainhart, Secretary, 913 E. St., NW, Washington 4, D. C.

NISA, Louisville Chapter. W. C. Krauth, Secretary, 118 S. 1st St., Louisville, Ky.

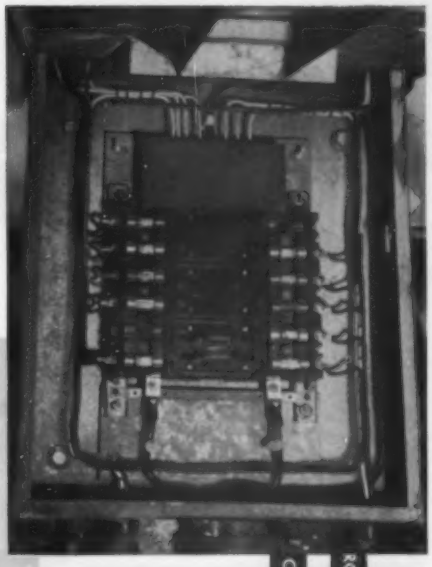
NISA, New Orleans Chapter. William Dreis, Secretary, 1517 Calliope St., New Orleans, La.

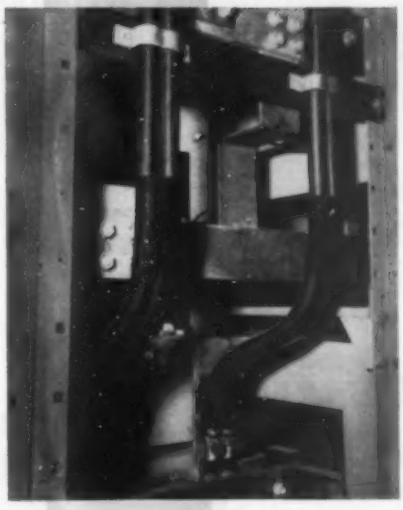
NISA, Mid-South Chapter. Murphy G. Miller, Secretary, 109 Jennings Ave., Knoxville 17, Tenn.

NISA, Southwestern Chapter. George Foshee, Secretary, 203 S. Main, Fort Worth 4, Tex.

NISA, Electric Club of West Virginia. O. E. Jenkins, Secretary, c/o Guyan Machine Co., Logan, W. Va.

How a Texas chemical company solved a tough cable requirement





High ambient temperatures, together with corrosive fumes from acids and caustics, may cause cables to disintegrate within a few months... unless you've specified the correct insulation.

That is one of the reasons why a large Texas chemical company specified Rome Synthinol® 901 insulated wire and cable for plant wiring. This special compounded polyvinyl chloride insulation provides *exceptional resistance* to acids, oils, corrosive fumes, greases, moisture, and heat deformation for most applications through 600 volts.

Its performance has been so good that it is now one of the most frequently specified cable insulations for chemical plants, oil refineries, paper mills, steel mills and similar industrial plants. Ask your purchasing department to check this.

You will save time and money on the installation of Rome Synthinol 901. It is uniform in diameter and easy to pull. Permanent color coding helps to identify circuits quickly.

Rome Synthinol 901 Insulated Wire Approvals

Appliance Lead Wire—Underwriters approved for 600 v. at 90°C. through size No. 4/0 AWG. Approved for 105°C. on smaller sizes No. 24 through No. 16 AWG.

Type TW—Underwriters approved as Type TW for 60°C. operation, under the National Electric Code. High resistance to heat means greater safety factor at elevated temperatures.

Machine Tool and Control Wire—Underwriters approved as Type TW, with end use approval for 90°C. operation in air; 60°C. where exposed to oil and in wet locations. Conforms with National Machine Tool Builders' Association standards. Resistant to extreme ambient temperatures, acids, oils, cutting solvents and flame.

It Costs Less to Buy the Best

ROME CABLE
Corporation
ROME · NEW YORK
and
TORRANCE · CALIFORNIA

ROME CABLE CORPORATION, Dept. ES-2, Rome, N. Y.
Please send information on Rome Synthinol and Rome Synthinol 901

Name.....

Company.....

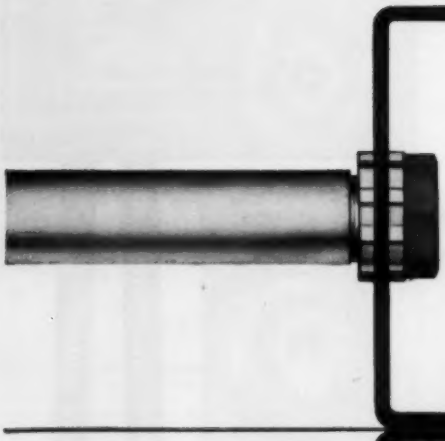
Address.....

City..... Zone..... State.....

Introducing

insuline

AN ENTIRELY NEW CONCEPT IN FITTINGS FOR . . .

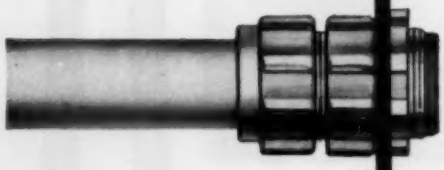


STANDARD RIGID CONDUIT

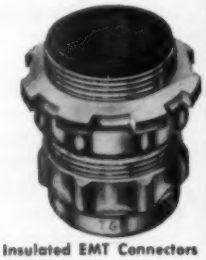
Insulating Bushing

Insulated Metallic Bushing*

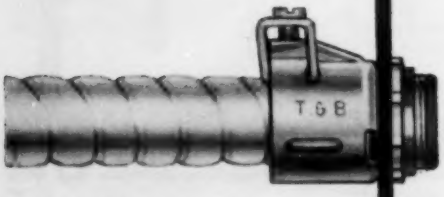
Insulated Chase Nipple*



ELECTRICAL METALLIC TUBING



Insulated EMT Connectors



FLEXIBLE CONDUIT OR ARMORED CABLE

Insulated Tite-Bite Connector — straight

Insulated Tite-Bite Connector — 90°

*Patents Applied for

*available soon

ABSOLUTELY THE FIRST LINE OF SELF-INSULATED RACEWAY FITTINGS . . . ANOTHER NEW T & B ENGINEERED EXCLUSIVE . . . DESIGNED FOR LOWEST INSTALLED COST . . . BRIGHT BLUE FOR EASY INSPECTION

insuline fittings – exclusive with T & B – permit a new high in electrical wiring practices, new ease of wiring installation and inspection. Here, for the first time, is a line of raceway fittings each with its own integral insulating unit!

insuline fittings – for Standard Rigid Conduit, E.M.T., and Flexible Conduit offer absolute wire protection. Tough T & B "insulining" provides a slick passage for easy wire pulling without wire skinning abrasion . . . for use wherever the Code requires protection for cable sheath or wire insulation against damage from metal surfaces. (1953 NEC, Para. 3736b – Insulation at Bushings.)

insuline fittings – for easy inspection – offer visual evidence that the connection is insulated. Brilliant blue T & B "insulining" protrudes slightly beyond the fitting body forming a telltale ring that an inspector can see at a distance.

For free samples and technical data, contact your nearby T & B Distributor or write to the address below.

LOOK FOR THIS SIGN — AUTHORIZED DISTRIBUTOR T&B ENGINEERED

All T & B INSULINE fittings bear Underwriters' Laboratories approval.

IT'S THE MARK OF AN AUTHORIZED **T & B** DISTRIBUTOR

The complete line of T & B fittings for conductors and raceways is sold only by recognized electrical wholesalers. It's our way of assuring you the service and savings of a friendly local source. Call him for all your electrical needs. T54

THE THOMAS & BETTS CO.

INCORPORATED

Butler Street • Elizabeth 1, New Jersey

Thomas & Betts Ltd., Montreal, P.Q., Canada

MANUFACTURERS OF QUALITY ELECTRICAL FITTINGS SINCE 1898

News of the industry

edited for Southern readers

Body named to formulate FHA wiring proposals

AN ELECTRICAL INDUSTRY body has been named to formulate proposals to the Federal Housing Administration for improved wiring provisions in new housing which qualifies for FHA-insured mortgages, Howard R. Stevenson, assistant manager of operations, Detroit Edison Co., stated recently.

As chairman of the industry committee on interior wiring design, on which he is an Edison Electric Institute representative, Mr. Stevenson announced the following appointees to a subcommittee which at FHA's request, will submit suggestions for a revision upward of electrical provisions in the Minimum Property Requirements of the government agency:

H. H. Watson, General Electric Co., representing the National Electrical Manufacturers Association; A. Carl Bredahl, Westinghouse Electric Corp., representing Illuminating Engineering Society; E. R. Cornish, research director and representative of the National Electrical Contractors Association; John Newton, Sr., president, Oakes Electric Co., Holyoke, Mass., representing the National Association of Electrical Distributors. John F. Biggi, National Adequate Wiring Bureau, New York City, is secretary of the subcommittee.

Appointment of the task group followed a meeting of FHA and electrical industry representatives to discuss the need for getting better electrical capacity into new homes in which the government agency has a financial stake.

Present provisions inadequate

Present electrical provisions of the Minimum Property Requirements in use by the FHA fall far short of the objectives of "adequacy" and "efficiency" for which the provisions were originally set up, according to Mr. Stevenson.

The MPR now in use are below the voluntary standard of a 100-ampere service entrance minimum, as adopted during the past summer by the National Association of Home Builders. NAHB provisions in turn cover only the service entrance portion of the adequacy standards promoted by the National Adequate Wiring Bureau.

These National Adequate Wiring Bureau standards embody minimum circuit and conductor requirements, plus a wiring design layout which furnishes the home owner with a stipulated number of lighting and convenience outlets and wall switches placed in accordance with the modern concept of convenience. When the Adequate Wiring service entrance minimum is followed, the home electrical system has a capacity of 100 amperes or 24,000 watts to supply recommended levels of lighting and numerous major appliances. Wiring for future needs is a major consideration of this electrical standard.

Federal Housing Administration officials recently announced a decision to recognize in minimum requirements the fact that homes must be wired now for growing electrical loads. Present Minimum Property Requirements vary with regional conditions, but in general permit an insufficient number of circuits to be installed. Provision is made for only a relatively low power use. Also under present requirements the builder need not furnish complete electrical specifications with his plans, an omission which the electrical industry would like to see remedied.

BLACKHAWK APPOINTMENT — Robert J. Griffin, left, talks over features of the Blackhawk line with K. D. Rose, sales manager, Blackhawk Industries, Dubuque, Iowa. Mr. Rose was recently in the South to arrange the appointment of Griffin & Griffin, manufacturers' agents, 931 West Peachtree, N. E., Atlanta, as representatives for the Blackhawk line.

St. Petersburg enforces 100 amp minimum ruling

A NEW CLAUSE in St. Petersburg's electrical code points the way to more business for electrical contractors, more adequate wiring facilities for the homemaker, and less headaches to sellers of home electrical appliances. And it sets a trend whose pattern throughout the South would mark a step in line with the increasing swing to electrical living.

The new code clause requires all new homes to have a meter board with 100 ampere capacity instead of the 60 amp box formerly required.

This new electrical requirement apparently caught some builders unawares since they claim they never heard about it until electrical inspectors began enforcing it recently. Yet, according to Chief Electrical Inspector Charles Metcalf, the new proviso is already standard on Florida's east coast and is being included to permit homeowners to install the new heavy-current consuming appliances without the need for revamping the home's entire wiring system.

Despite the fact that the new law passed a final reading by City Council last September 21, becoming effective 20 days later, and

SUNBEAM LIGHTING; A WISE INVESTMENT, A REAL SAVINGS

You owe it to yourself and your client to make every lighting dollar count. Experience shows over and over again that a wise initial investment leads to many savings in the long run. Quality can be reasonably priced but it cannot be compromised. Invest in planned lighting and in SUNBEAM lighting fixtures which are scientifically designed to produce efficient, effective and comfortable illumination. Invest and save in SUNBEAM Visionaires of quality construction and for long-period, minimum maintenance.

The First National Bank at Santa Fe, New Mexico wisely invested in and installed over 200 Sunbeam #5602-48RS recessed units equipped with curved Controlenses*. Mounted at a height of 25 feet (which is a challenge for good lighting) in an attractive pattern, the light output is controlled for maximum, glare-free illumination in the important work zones. Specially engineered for top servicing in this installation, the units will save many dollars in easier maintenance. Sunbeam lighting engineers will gladly, and without obligation show where lighting dollars may be saved on your lighting projects.

SUNBEAM visionaire LIGHTING COMPANY

SUNBEAM

LIGHTING COMPANY · 777 EAST 14TH PLACE · LOS ANGELES 21

that all electrical contractors in the city were notified of the change and given a "courtesy period" up to the end of 1954, during which enforcement would be stayed, some builders are up on their hind legs.

They avow that since the new fuse box involves an extra cost of about $75 per house, houses they've already wired and sold should be exempted from the new code.

Building Director Henry Neilsen is adamant. "This is a measure that helps the public," he said. "Appliance stores sell more air conditioners, dishwashers and other devices, but many homes don't have enough electrical circuits to handle the additional load."

G-E transformer plant set for Hickory area

A NEW $20,000,000 distribution transformer plant, another major expansion of the General Electric Company's manufacturing facilities, will be built in the Hickory-Newton-Conover area of North Carolina, the company has announced.

The new plant, which eventually will employ 1100 persons, will be a highly mechanized, modern plant with 400,000 square feet of floor space including a single story factory building and a completely air-conditioned office building. Construction will begin early this year and is expected to be completed in late 1956.

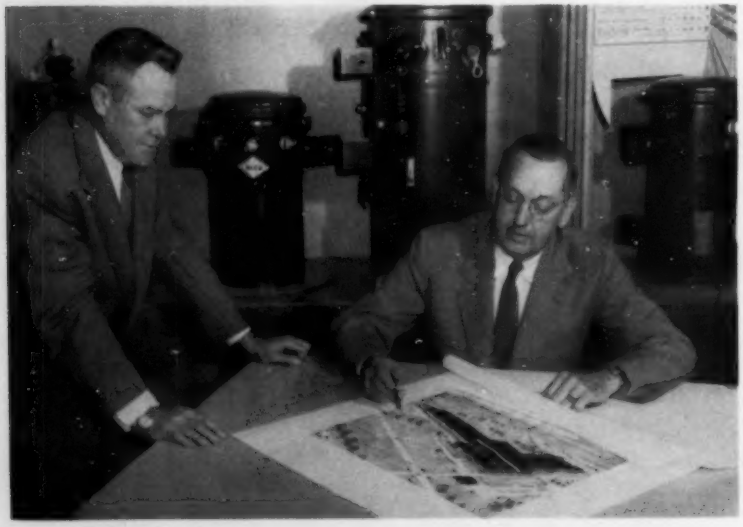
Raymond W. Smith, General Manager of G-E's Distribution Transformer Department, with headquarters in Pittsfield, Mass., said that the plant represents an investment in the belief that home owners will more than double their electric power usage in a few years. He explained that large quantities of distribution transformers will be needed by utilities to furnish more electric power to homes. Power transmitted at high voltages for economic reasons is reduced to the low voltage used in homes by distribution transformers. More or larger transformers are required to handle the power whenever there is a large increase in power consumption.

"We have selected the Southeast section of the country since it is in this area that great future growth is forecast," Mr. Smith said.

Employees will be hired from the local plant area except for about 100 technicians and specialists who will be transferred from Pittsfield, Mr. Smith said.

Alex C. Boisseau, formerly manager of the Holyoke, Mass., distribution transformer plant was named manager of the new plant by Mr. Smith. Mr. Boisseau, born in Petersburg, Va., was a 1928 graduate of Washington & Lee University, Lexington, Va.

The plant location will be in the foothills of the Piedmont Range at an altitude of more than 1,000 feet.



Looking over an architect's drawing of General Electric's new $20,000,000 distribution transformer plant, which will be constructed in the Hickory-Newton-Conover area of North Carolina, are two of the company's Distribution Transformer Department executives—James L. Elrod, left, manager of marketing, and Raymond W. Smith, seated, general manager.

New Orleans industry groups elect officers

ELECTRICAL INDUSTRY organizations in New Orleans in a series of recent meetings have elected officers for 1955.

Officers of the Electrical Association of New Orleans for 1955, as elected at the annual dinner of the association recently, include W. A. Barnes, president; C. Espy Reed, executive vice-president; Hicks L. Youngs, vice-president wholesalers, utilities, manufacturers; Charles Justice, vice-president appliances; J. N. Nunez, vice-president electrical contractors; E. T. Brooks, vice-president air conditioning and ventilation; Stan Reinherz, vice-president radio and television; W. E. Clement, director of publicity; E. H. Mowen, secretary; and Amos Brewer, treasurer.

The Electrical Association Executive Committee lists W. P. Massey, E. N. Avegno, A. B. Paterson, Jr., E. J. Hemard, Jr., S. A. Greco, Frank Prattini, T. C. Lauck, Chester Flick, Arthur Wachter and George F. Sins.

Arthur A. Levy has been announced as the new chairman of the New Orleans Section of the Illuminating Engineering Society. Jacob M. Gensburger will serve as vice chairman and S. Conrad Berdon as secretary-treasurer. The Board of Managers for 1955 is composed of Charles E. Corrigan, Walter T. Faber, Louis N. Goodman, Alvin C. Roche and Harry T. Bailey, Jr., ex-officio.

The Radio, Television and Appliance Association of New Orleans recently elected Stanley B. Reinherz as president for 1955. Officers for the year include Matt Ballatin, first vice-president; Leonard Estorge, second vice-president; Ray Conner, treasurer; and Wes Massey, secretary.

Members of the appliance group's Executive Committee are August Berner, William Bronston, Louis A. Conner, Bernard Deliberto, A. C. Denny, Otis Lazenby, Earl Leveck, C. J. Massa, George Mayoral, Ralph Miller, John O'Meallie, Robert V. Schumert, Robert D. Swezey, and Lenson Talbot.

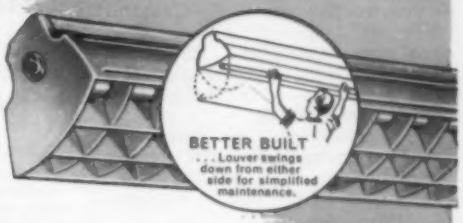
Vogel assesses TVA value as 'yardstick'

BRIGADIER GENERAL Herbert Vogel, newly-appointed TVA head, told the Memphis Engineers Club recently that if the Authority "were to assume the obligation of paying interest at any reasonable proper rate" the TVA would have to increase power rates or cut payments to the government.

General Vogel said that if the TVA is to be a true "yardstick,"

let's talk business about

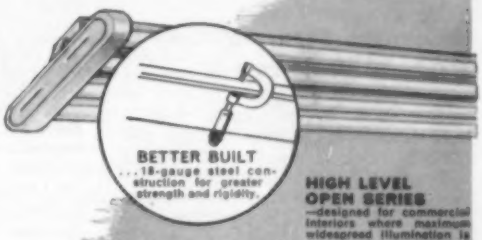
The **OFFICER**
—a trim, slender fixture to provide distinctive lighting to commercial interiors.



The **SCHOOLMASTER**
—an all-steel unit which provides upward light for comfort lighting, ideal for close seeing.

what makes **BETTER BUILT** Lighting Units

BETTER BUSINESS for YOU!

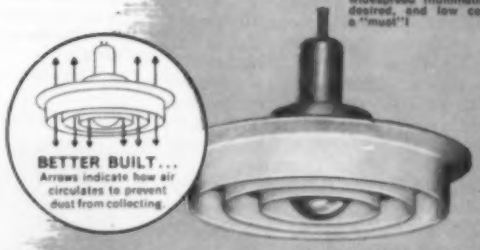


HIGH LEVEL OPEN SERIES
—designed for commercial interiors where maximum widespread illumination is desired, and low cost is a "must"!

It is good business to insist on units with "Better Built" features like those illustrated here. That's because such features help cut operating costs, speed up and simplify maintenance, and insure reduced obsolescence and long-life dependability.

It is good business for the user, because such units give better service and save more money. It is good business for those who recommend and install lighting equipment, because the installation of such units results in greater satisfaction and increased good will.

Shown here are but a few Benjamin Leader Line units, each with just one of its "Better Built" features. Manufacturing "Better Built" lighting equipment is a tradition with Benjamin. That's why you can rely on getting Benjamin Quality in every Leader lighting unit.



CONCENTRIC RING
—meets rigid requirements of Boards of Education for economy combined with quality light.

TROFFERLITE with Holophane Controlens*—designed for locations where controlled quality lighting is desired.

*Copr., the Holophane Co.

For a complete showing of the Benjamin Leader Line, send for our FREE CATALOG.

BETTER BUILT TO SERVE YOU BETTER

BENJAMIN
TRADE MARK
Leader Line

Exclusive licensees of the Leader Line in Canada: Robertson Irwin Limited, Hamilton, Ontario

Sold Exclusively through Electrical Distributors

Leader Division of Benjamin Electric Manufacturing Company, Dept. Z-1, Des Plaines, Illinois . . . makers of famous Benjamin and Leader Line lighting equipment and sound signals for industry, institutions and Commerce.

D-287B

consideration will have to be given to paying interest and at least, allowing on paper for taxes. He added "Yardsticks also include profit, which any industry is entitled to make."

Electric home heating gains in AG&E territory

ELECTRIC HOME HEATING is gaining acceptance rapidly in the area served by the American Gas and Electric Co., according to a recent announcement. Some 165 new electric heating systems were installed in homes in the AG&E area in a recent month.

The company's announcement said that there were 2,306 electric home heating installations in the AG&E area at the end of September, 1954.

Among the operating companies in the American Gas and Electric group is the Appalachian Electric Power Co., Roanoke, Va.

Bradenton-Sarasota ECA elects 1955 officers

ELECTION OF OFFICERS was a main item of business during the recent meeting of the Manatee-Sarasota County Electrical Contractors Association, which serves the area around Bradenton and Sarasota, Fla.

Officers elected to head the group for 1955 are President, James R. Ward, Ward Electric, Bradenton; Vice-President, Dale Weedman, Electric and Gas Co., Sarasota; Secretary-Treasurer, Don Parker, Roy Parker Electric, Bradenton, and FAEC State Director, W. S. Stewart, Stewart Electric, Bradenton.

President Ward appointed the following standing committees:

Legislative Committee: Chairman, K. O. Stanford, Stanford Electric, Bradenton; J. H. Cobb, J. H. Cobb Electric, Sarasota; and Ralph Anderson, Anderson Electric, Venice.

Credit Committee: Chairman, Don Parker, Roy Parker Electric, Bradenton; Dick Willis, Willis Electric, Sarasota; and Tom La Byer, La Byer Electric, Nokomis.

Jobber Relations Committee: Chairman, Ponder Baccus, Baccus Electric, Sarasota; Culbreath Whitehead, Culbreath Whitehead Electric, Bradenton; and Leroy Pearson, Pearson Electric, Bradenton.

Public Relations Committee: Chairman, Dale Weedman, Electric and Gas Co., Sarasota; Kenneth Higel, Higel Appliances, Venice; and C. B. Scott, Scott Electric, Palmetto.

Engineering Committee: Chairman, W. S. Stewart, Stewart Electric, Bradenton; Donald Stipp, Stipp Electric, Sarasota; and George Naylor, Naylor Electric, Sarasota.

Membership Committee: Chairman, Don Parker, Roy Parker Electric, Bradenton; Dale Weedman, Electric and Gas Co., Sarasota; and Tom La Byer, La Byer Electric, Nokomis.

The Policy Committee and Program Committee will be composed of the members of the board of directors of the chapter.

Mercury vapor lighting installed at Shelbyville

STRATEGICALLY LOCATED in the heart of the Blue Grass Basin of Tennessee, Shelbyville is famous throughout the country as the "Walking Horse Capital of the World." Here each year, early in the fall, is held the Tennessee Walking Horse National Celebration Horse Show, to which horse lovers flock from all over the country.

This past fall, the visitors were able to view Shelbyville's new mercury vapor lighting system along with the horses. Installed in time for the show, the new system consists of two Line Material Uni-Ballast circuits having a total of 54 Ovalite luminaires with 20,000 lumen, 400-watt E-HI lamps. The luminaires are mounted on six-foot upsweep brackets on 30-foot Union Metal Octaflute steel standards.

The new mercury vapor system, installed by the Shelbyville Electric System, under Manager P. J. Scudder, replaced incandescent lighting that had ornamental fixtures on short standards.

G-E Lamp Division opens New Orleans warehouse

THE LAMP DIVISION of General Electric Company has opened a full line company operated warehouse in New Orleans. Their new building, located at 4800 River Road, will stock all of the types of incandescent, fluorescent, mercury, photo and miniature light bulbs required for the four-state area served by the Delta Sales District.

T. C. Lauck, district manager of the Delta Sales District, with headquarters in New Orleans, has advised that this moves the entire order service operation for this area from Memphis, Tenn., to New Orleans. The Delta Sales District office, presently located in the Lee Circle Building, will be transferred to the new location after the first of the year.

W. L. Smith will be supervisor of the order service operation in New Orleans.

"The creation of the sales district with headquarters in New Orleans, and the opening of the full line warehouse, recognizes New Orleans as the logical distribution point for serving Louisiana, Mississippi, the Southern part of Alabama and the West Coast of Florida to Panama City," Mr. Lauck stated.

The new Uni-Ballast mercury vapor street light installation in Shelbyville, Tenn., enhances the daytime beauty of the north side of the city square as well as fulfilling its basic purpose of quality lighting.

If you sell, specify, or install electrical wiring devices : make it

P&S

Designed for Easy Wiring . . . for Hard Usage Year after Year

P & S KEYLESS LAMPHOLDERS

Practically every wiring installation calls for one or more of these lampholders. Strictly utilitarian, yes — but made of fine P&S porcelain with a quality P&S interior, they will give years of trouble-free service.

For 3¼" box — P&S 41.

For 3¼" and 4" boxes — P&S 110.

P&S 110

P & S PULL LAMPHOLDERS

P&S 4046-2

Feature one-piece construction — no separate shadeholder ring to loosen and fall off. Built-in mechanism of simplified design with terminal screws in most get-at-able position, eliminates necessity of removing interior to wire.

For 3¼" box — P&S 4026 with insulated chain, P&S 4026-2 with short chain and cord.
For 3¼" and 4" boxes — P&S 4046 with insulated chain, P&S 4046-2 with short chain and cord.

P & S PULL LAMPHOLDERS with CONVENIENCE OUTLETS

Have same one-piece construction as the P&S 4026 Line, PLUS a convenience outlet connected internally — no extra wires, soldering or taping. Ideal for attic, basement, garage, etc., where inexpensive lampholder with outlet is desirable.

For 3¼" box — P&S 5026 with insulated chain, P&S 5026-2 with short chain and cord.
For 4" box — P&S 5046 with insulated chain, P&S 5046-2 with short chain and cord.

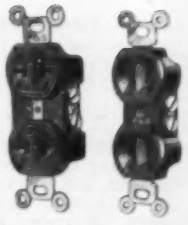
P&S 5046-2

P & S 1530 and 1570 — The OUTLETS with COMPLETELY INSULATED BACKS

Both P&S 1530 and P&S 1570 are easy to wire. Large head binding screws are spaced far apart — bodies are shorter, leaving more room in box. Plate screw hole in strap — no rivet to twist or turn. Both outlets have long-life phosphor bronze contacts — washer type ears — easy find slots.

P&S 1530 (brown) and P&S 1530-I (ivory) — T slot type.

P&S 1570 (brown) and P&S 1570-I (ivory) — Parallel slot type, double grip contacts.



P&S 1530

P&S 1570

Illustrated are just a few of the hundreds of wiring devices in the complete P&S line. All lampholders shown conform to Fed. Spec. W-L-142. Outlets conform to Fed. Spec. W-R-151. Every P&S device is a quality device — the result of experienced engineering, precision manufacturing and rigid inspection. Every P&S wiring device is BUILT TO LAST.

YOU CAN'T AFFORD LESS THAN THE BEST

Write Now for Catalog
Address Dept. ES

PASS & SEYMOUR, INC. SYRACUSE, N. Y.

OFFICES: 71 Murray St., New York 7, N. Y. • 1229 W. Washington Blvd., Chicago 7, Ill.
In Canada: Renfrew Electric & Refrigerator Co., Ltd., Renfrew, Ont.

Dates Ahead

National Adequate Wiring Bureau, 11th Annual Conference, LaSalle Hotel, Chicago, Ill., Feb. 24-25, 1955.

Southern Safety Conference and Exposition, Jung Hotel, New Orleans, La., Feb. 27-28, March 1, 1955. W. L. Groth, Exec. Dir., P. O. Box 8927, Richmond 25, Va.

American Institute of Electrical Engineers, Utilization of Aluminum Conference, William Penn Hotel, Pittsburgh, Pa., March 15-17, 1955.

Georgia Chapter, IAEI, Annual Meeting, Ralston Hotel, Columbus, Ga., March 21-22, 1955.

Southeastern Electric Exchange, Annual Conference, Boca Raton Hotel and Club, Boca Raton, Fla., March 21-23, 1955.

Oklahoma Utilities Association, Annual Convention, Mayo Hotel, Tulsa, Okla., March 24-25, 1955.

Mississippi Chapter, IAEI, Annual Meeting, Heidelberg Hotel, Jackson, Miss., March 28-29, 1955.

Southern Region, IES, Annual Conference, Ft. Harrison Hotel, Clearwater, Fla., March 31-April 1, 1955.

North Louisiana-East Texas Chapter, IAEI, Annual Meeting, Hotel Caddo, Shreveport, La., April 1-2, 1955.

Southwestern Region, IES, Annual Conference, Gunter Hotel, San Antonio, Texas, April 3-5, 1955.

Southeastern Electric Exchange, Engineering and Operation Section, Roosevelt Hotel, New Orleans, La., April 7-8, 1955.

American Institute of Electrical Engineers, Southern District Meeting, St. Petersburg, Fla., April 13-15, 1955.

Alabama Chapter, IAEI, Annual Meeting, Thomas Jefferson Hotel, Birmingham, Ala., April 14-15, 1955.

Tennessee Chapter, IAEI, Annual Meeting, Andrew Jackson Hotel, Nashville, Tenn., April 18-19, 1955.

Protective Relay Engineers, Eighth Annual Conference, Department of Electrical Engineering, A. & M. College of Texas, College Station, Texas, April 25-27, 1955.

South Carolina Chapter, IAEI, Annual Meeting, Hotel Columbia, Columbia, S. C., May 3-4, 1955.

American Institute of Electrical Engineers, Electric Heating Conference, LaSalle Hotel, Chicago, May 10-11, 1955.

North Carolina Chapter, IAEI, Annual Meeting, Carolina Hotel, Raleigh, N. C., May 10-11, 1955.

District 5, NECA, joint meeting with IBEW, Texas Hotel, Fort Worth, Texas, May 9-12, 1955.

National Association of Electrical Distributors, 47th Annual Convention, Conrad Hilton Hotel, Chicago, Ill., May 22-25, 1955.

District 3, NECA, Annual Meeting, George Washington Hotel, Jacksonville, Fla., June 2-3, 1955.

National Industrial Service Association, 22nd annual convention of the national association of motor repair shops, Hotel Statler, Los Angeles, Calif., June 6-10, 1955.

Southeastern Electric Exchange, Personnel Administration Section, Roanoke Hotel, Roanoke, Va., Aug. 11-12, 1955.

Southeastern Electric Exchange, Engineering and Operation Section, Charlotte Hotel, Charlotte, N. C., Sept. 22-23, 1955.

Southern Section, IAEI, Annual Meeting, Jung Hotel, New Orleans, La., Oct. 3-5, 1955.

Southeastern Electric Exchange, Accounting Conference, Hotel San Carlos, Pensacola, Fla., Oct. 20-21, 1955.

Southeastern Electric Exchange, Sales Conference, Biltmore Hotel, Atlanta, Ga., Oct. 27-28, 1955.

Union Electric becomes publicly owned company

A NEW ERA in the life of Union Electric Company of Missouri, St. Louis, began recently when it became an independent company for the first time with the dissolvement of North American.

On January 20th, 8,572,624 shares of Union Electric common stock were distributed share for share to North American stockholders, completing the distribution of North American holdings in Union Electric under the terms of its liquidation program. During the last two years, 1,697,120 shares of Union Electric common stock have been distributed to North American stockholders.

In completing its liquidation program, North American will transfer all of its remaining net assets, representing cash and sundry investments, to Union Electric. These assets, together with previous additions to Union Electric's common equity by this program, total $40,000,000.

This addition to the financial strength of Union Electric will provide an opportunity for greater growth and development. System output during the 12 months ending November 30, 1954, was over 7⅛ billion kilowatt hours, an increase of 288 million over the same period in 1953.

Subsidiaries of Union Electric are Union Electric Power Co., Missouri Power & Light Co., Missouri Edison Co., Union Colliery Co., Poplar Ridge Coal Co., and the St. Louis & Belleville Electric Railway Co.

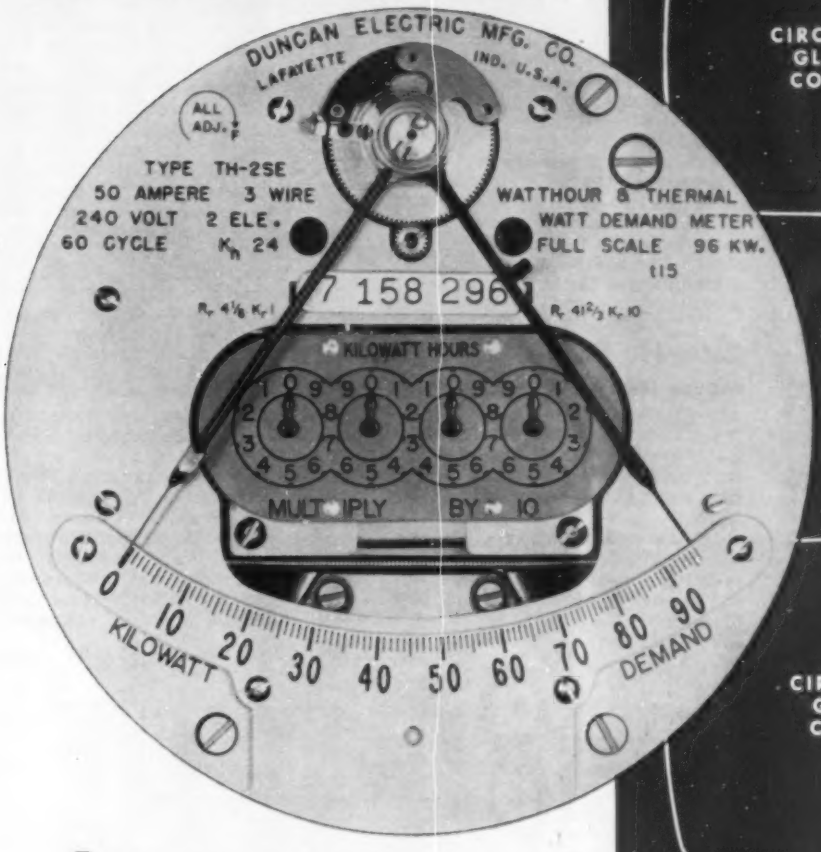
Noland, Hagerstown, moves to new quarters

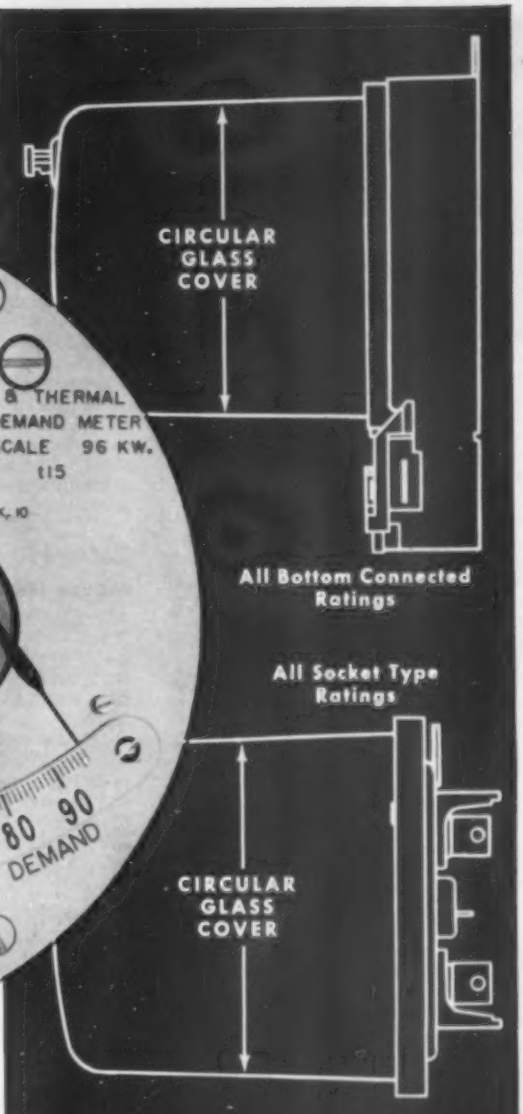
THE NOLAND Company's branch in Hagerstown, Md., recently moved to new quarters at 1016 Virginia Ave. This is a new building, with an attractive showroom and plenty of parking space. The firm handles a complete line of lighting fixtures, appliances, and plumbing supplies.

Nearly 600 persons attended the branch's open house ceremonies. Officials from the company's headquarters present for the opening included L. U. Noland, Jr., president; John Sommers, executive vice-president; M. G. Smith, vice-president in charge of operations; R. M. Gindhart, vice-president and treasurer, A. N. Unger, assistant treasurer, and C. P. Andrew, general manager of the company's electrical departments.

R. D. Etzler, who came to this branch in 1930 from Winston-Salem, N. C., as a salesman, is manager of the Hagerstown operation.

COMPACT DESIGN!





1. Complete Polyphase Combination Thermal in standard circular glass covers—saves space.

2. Available in all types and ratings—3- or 4-wire.

3. Built in "extended range" ratings—self-contained capacity to 200 Amps.

4. All calibrating adjustments accessible from front.

DUNCAN ELECTRIC MFG. CO.

LAFAYETTE INDIANA

Pioneers in Extended Range Metering

DUNCAN

POLYPHASE COMBINATION THERMAL DEMAND METERS

REA consumer received more for money in '54

COST OF ELECTRICITY to rural consumers served by REA-financed systems dropped and the sale of energy on the systems climbed sharply in calendar year 1954, the U. S. Department of Agriculture has reported in a year-end summary of the activities of the Rural Electrification Administration.

Cost of power to the residential consumer, including both farm and non-farm, was down to an average of 3.06 cents per kwh from 3.22 cents in 1953. Energy sales were up to 16.5 billion kwh—an increase of 2.8 billion kwh over the previous year. This increase alone is more power than all the REA borrowers sold in 1946.

The average annual bill of residential consumers was $84.36—an increase of 8.7 per cent over 1953. But the average annual usage per residential consumer climbed to 2,748 kwh—an increase of 13.9 per cent. "In other words," said REA Administrator Ancher Nelsen, "the farmer served by REA-financed systems is getting more for his electric dollar than ever before."

Although the farm consumer paid less per kwh for electricity in 1954, the net margins of the REA borrowers from system operations went up nearly 40 per cent. A reduction in the cost of energy put into the systems and more efficient operation by the borrowers made this possible, according to Administrator Nelsen. Cost of energy put into the systems in 1954 averaged 7.47 mills per kwh—a drop of .23 mills under the previous year. The net margin from operations went up from $30.8 million to $42.7 million.

During 1954, REA borrowers added about 38,700 miles of line and connected 151,000 consumers. This increased their total line mileage to 1,336,000 and total consumers to 4,176,000.

Electric loans approved by REA during the year exceeded those of 1953 by $26.8 million. In 1954 the agency approved loans totaling about $171 million. They provide for service to 116,000 consumers, or about 11,000 more than were provided for by loans in 1953. Total loans in the program now have reached nearly $3 billion.

In 1954, the REA borrowers paid $98 million in interest and principal on their 2 per cent loans and continued their excellent repayment record. At the year's end only 15 of the agency's 1001 active electric borrowers were delinquent in payments more than 30 days, and the amount overdue was less than one-tenth of one per cent of the amount billed. Also in 1954, the REA borrowers increased their advance repayment of borrowed money by more than $16 million. At the end of the year, payments on principal ahead of schedule amounted to $79 million.

Tristate Electrical holds industrial show

THE TRISTATE ELECTRICAL Supply Co., Inc., recently staged an industrial show at their Cumberland, Md., branch's new facilities at 30 Wineow St.

The display area for the show covered some 2500 square feet of floor space. Eighteen booths were arranged in a square and two center aisles to accommodate the 18 manufacturers represented in the show. The company reported that attendance at the show was "most gratifying."

Columbia Electric Supply moves into new quarters

COLUMBIA ELECTRIC SUPPLY, formerly located at 1145 7th St., N. W., in Washington, D. C., has moved into new quarters at 635 K St., N. W.

In the new location, Columbia boasts ample off-street parking facilities and an ultra-modern show room with a complete line of stock.

California fixture firm constructs new factory

A NEW 66,000 square foot home has been constructed by Fluorescent Fixtures of California, San Francisco, manufacturers of "All-Brite" die-formed fluorescent and slimline fixtures.

The new building serves as the main factory and offices for the company and is located in the heart of a rapidly growing industrial tract on Shaw Road in South San Francisco, opposite the San Francisco Airport. The main building and its adjoining facilities occupy 107,000 square feet of ground, served by spur track, and with parking accommodations for over 100 automobiles.

Features of the new "All-Brite" plant include the latest production line methods and techniques for the manufacture of fluorescent and slimline lighting fixtures. Of outstanding interest in this latest "All-Brite" development is the featuring of the new Ransburg Reciprocating Electrostatic Paint Process.

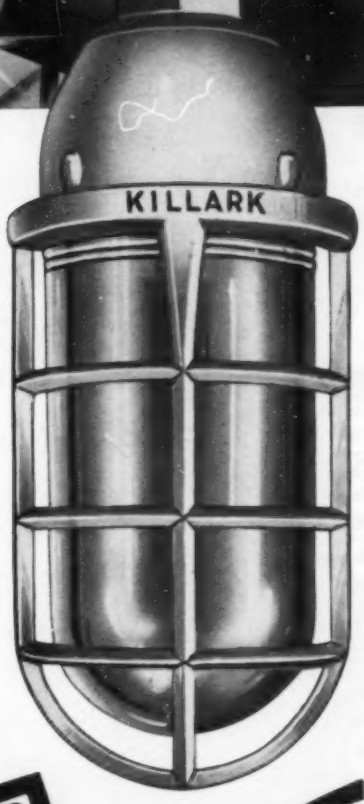
President and founder of Fluorescent Fixtures of California is Ernest O. Anders. Charles D. Buchanan is vice-president; Robert Shaffer is works manager, in charge of layout and production; and Robert Thallon is assistant sales manager and chief engineer.

"My name's Butterfingers—What's yours?"

KILLARK *Alumalloy* FITTINGS

Solve Corrosion Problem

at Apex Smelting Company



APEX SMELTING COMPANY

ALUMINUM · MAGNESIUM · ZINC ALLOYS

2527 WEST TAYLOR STREET

CHICAGO 12, ILLINOIS

January 14, 1954

Killark Electric Manufacturing Co.
1940 Easton Avenue
St. Louis, Missouri

Attention: Mr. James Grindell, Sales Manager

Dear Mr. Grindell:

We believe you will be interested in learning of the very excellent results we have experienced using Killark electrical fittings in our operation of a magnesium reclamation and alloying plant. We had encountered serious corrosion problems which were caused by the fluxes and chemicals used, and the nature of these problems was two-fold.

First, there is a combination of sulfur dioxide with moisture in the air to form probably sulfurous acid, together with this, there is present in the room air varying amounts of hydrochloric acid created by hydralysis of commercial fluxes used with magnesium. These two, while being well below toxic values, cause corrosion to ferrous metals. In addition, the thermal air currents deposit the above mentioned fluxes on structures of all kinds. These materials are hygroscopic, and since they are principally magnesium chloride, they form acid solutions with water from the atmosphere.

As a result of these corrosive actions, we were not able to maintain electric lines in safe operating condition for periods over six months. Conduit, fittings, terminal boxes, pull boxes and attachment screws would all corrode so severely that we would pick up moisture from the surrounding hygroscopic chemicals and short out the lines. This was true with thin-wall and rigid conduit and fittings and with both cadmium and zinc plating and with various types of paints and coatings.

Since applying the Killark aluminum fittings along with aluminum conduit, we have experienced no failures for approximately a year, and upon examination there is no indication that corrosion is progressing. We are confident that we have arrived at a practical solution.

Very truly yours,

APEX SMELTING COMPANY

A. J. Peterson,
Vice-President.

. . . and the next time you make an electrical installation in an industrial atmosphere of corrosive fumes or dusts, or one of excessive moisture or humidity — be sure to remember the name KILLARK. You'll be mighty glad (and so will your client) that you allowed for the extra margin of safety and the added years of life that Killark fittings and fixtures offer: they *can't* corrode — or rust . . . they're made of sturdy, exclusive Alumalloy, the twentieth century metal! Lightweight, too . . . safe and non-sparking . . . roomier for easier splicing.

KILLARK ST. LOUIS

Killark

"Killark . . . a fitting name to remember"

ELECTRIC MANUFACTURING COMPANY

ENTRANCE FITTINGS • CONDUIT BODIES • FLUSH SWITCH FITTINGS • EXPLOSION-PROOF FITTINGS • VAPOR-TIGHT LIGHT FIXTURES • EXPLOSION-PROOF LIGHT FIXTURES • SEALED BEAM FIXTURES

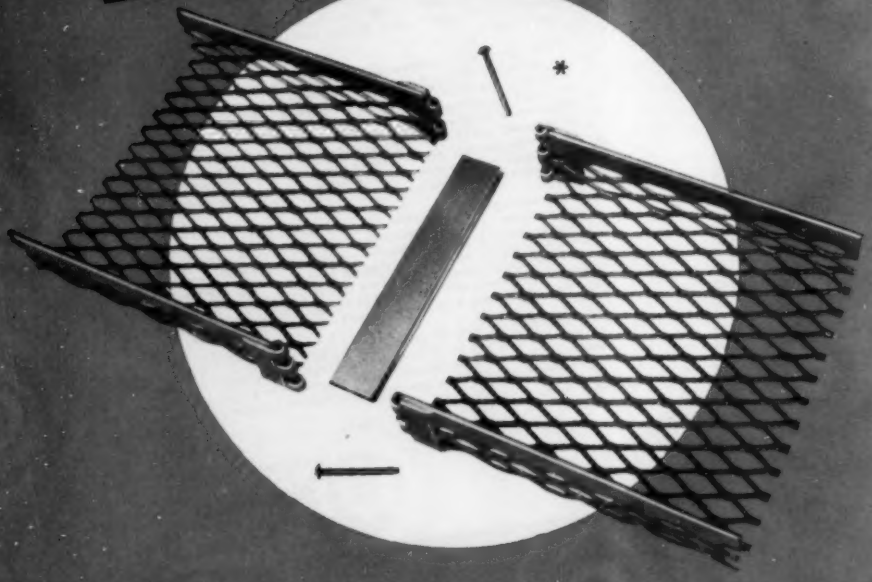
Vandeventer and Easton Aves. St. Louis 13, Missouri

SALES OFFICES and WAREHOUSE STOCKS	ATLANTA	69 Mills St., N. W.	DALLAS	1903 Griffin St.	PHILADELPHIA	2014 Chancellor St.
	BOSTON	49-51 D St.	DENVER	1073 Galapago	PITTSBURGH	50 26th St.
	BUFFALO	278 Johnson St.	DETROIT	8319 Mack Ave.	SAN FRANCISCO	714 Harrison St.
	CHICAGO	1528 West Adams St.	LOS ANGELES	412 Seaton St.	SEATTLE	4130 First Ave., S. W.
SALES OFFICES	BALTIMORE	11 W. 25th St.	COLUMBUS	2700 E. Main St.	MINNEAPOLIS	826 Andrus Bldg.
	CINCINNATI	49 Central Ave.	KANSAS CITY, MO.	616 W. 26th St.	NEW YORK	600 W. 181st St.

Announcing another Cope FIRST

the new COPE CABLE TROUGH

WITH THE BUILT-IN COUPLER



up to 80% SAVINGS in erection time

The new Cope coupler is an integral part of all units. A metal "Σ" shaped piece is also supplied for each joint to fit between the ends of the mesh and thus eliminate sharp edges. Cope Cable Trough Systems are available in widths of 6", 9", 12", 18" and 24" and in straight lengths of 8', 10' and 12'. A wide range of fittings for each width permits the system to be rapidly assembled on the job site to conform to any plant layout.

Should field cutting of the trough be required, special bolt-on couplers are available which will join the cut-off end of the trough to the regular pin-type coupler.

Cope

T. J. COPE, INC.

711 SOUTH 50th ST., PHILADELPHIA 43, PA.

*Patent Pending

ANOTHER EXAMPLE OF Cope LEADERSHIP...

REPRESENTATIVES

AMARILLO, TEXAS
Williamson Sales Co., Box 1324

ATLANTA, GEORGIA
The Gearhart Co., P. O. Box 85, Northside Station

BALTIMORE, MARYLAND
J. D. Amelia, 208 W. Chesapeake Ave., P. O. Box 6759, Towson, Baltimore, Md.

BEAUMONT, TEXAS
Williamson Sales Co., P. O. Box 3164

BIRMINGHAM, ALABAMA
The Gearhart Company, 1727 Sixth Avenue, North

BOSTON, MASSACHUSETTS
J. J. Costello Co., 131 Clarendon Street

BUFFALO, NEW YORK
Vincent J. Brown Co., 564 Ellicott Square

BUTTE, MONTANA
Fred W. Carlson, 604 Utah Avenue

CHARLOTTE, NORTH CAROLINA
Glenn & Larson, 123 Brevard Court

CHICAGO, ILLINOIS
Hooper-Green Co., 407 S. Dearborn St.

CLEVELAND, OHIO
E. F. Burke Agency, 1900 Euclid Avenue

CORPUS CHRISTI, TEXAS
Williamson Sales Co., 922 Wilshire St.

DALLAS, TEXAS
Williamson Sales Co., Slocum at Cole St.

DEARBORN, MICHIGAN
George R. Horne Company, 22187 Michigan Avenue

DENVER, COLORADO
Hamilton Associates, 1236 Elati Street

DES MOINES, IOWA
Geo. W. Swallow, Chas. L. Ward Co., 5707 Waterbury Circle

HOUSTON, TEXAS
Williamson Sales Company, 5541 Armour Drive

HUNTINGTON, WEST VIRGINIA
Muller, Harper & Assocs., Inc. 407 Twelfth Street

INDIANAPOLIS, INDIANA
Hooper-Green Co., 6216 Carrollton Ave.

JACKSON, MISSISSIPPI
Williamson Sales Company P.O. Box 3223, West Jackson Station

KANSAS CITY, MISSOURI
Chas. L. Ward Co., 3122 Roanoke Road

LOUISVILLE, KENTUCKY
Hooper-Green Company, 319 Marion E. Taylor Bldg.

MIAMI, FLORIDA
The Gearhart Co., 416 Langford Bldg.

MINNEAPOLIS, MINNESOTA
The Klass Company, 814 So. Ninth St.

NEW HAVEN, CONNECTICUT
J. J. Costello Co., P. O. Box 88

NEW ORLEANS, LOUISIANA
Williamson Sales Company 210 Delta Bldg.

NEW YORK, NEW YORK
David M. Miller Co., Inc., 31 Nassau St.

OKLAHOMA CITY, OKLAHOMA
Harold E. Bates, Chas. L. Ward Co., 3125 N.W. Grand Blvd.

PHILADELPHIA, PENNSYLVANIA
The Bradley Co., 3341 Arch Street

PINE BLUFF, ARKANSAS
Williamson Sales Company, P.O. Box 3

PITTSBURGH, PENNSYLVANIA
Muller, Harper & Assocs., Inc., First National Bank Bldg.

PORTLAND, OREGON
Fred W. Carlson, 935 Northwest 12th St.

ST. LOUIS, MISSOURI
Edwin S. Waterman, 494 Arcade Bldg., 812 Olive Street

SAN ANTONIO, TEXAS
Williamson Sales Company, Box 1324

SAN FRANCISCO, CALIFORNIA
Geo. E. Henn Co., 420 Market Street

SAN GABRIEL, CALIFORNIA
H. J. Randolph Co., 736 Santa Anita St.

SEATTLE, WASHINGTON
Fred W. Carlson, 2307 Fifth Avenue

SHREVEPORT, LOUISIANA
Williamson Sales Company P.O. Box 1223

SYRACUSE, NEW YORK
Vincent J. Brown Co., 218 Harrison St.

CANADA

CALGARY, ALBERTA
Bunston, Ltd., 510 9th Avenue, West

DORVAL STATION, P. O. (Montreal)
Marshall Equipment Co., Inc., P. O. Box 28

VANCOUVER, B. C.
Bunston, Ltd., 2532 Yew Street

FOREIGN

MANILA, PHILIPPINE ISLANDS
Communications Electrical Equipment & Supply Co., Inc., 517 Dasmarinas, P. O. Box 58

SANTURCE, PUERTO RICO
Victor M. Garcia, 1357 Ponce de Leon Ave.

The New Cope Cable Trough has a built-in coupler . . . this is typical of the constant efforts of T. J. Cope, Inc. to bring you a stronger and more economical product.

In line with these efforts, Cope pioneered and developed the acceptance of Cope Cable Trough through original design, engineering service and high quality manufacturing standards.

Now Cope has anticipated its many customers' needs for a product which will save up to 80% in erection time and give still greater strength.

Every straight length and fitting in the versatile Cope Cable Trough system now has a built-in coupler—no more nuts, bolts and washers!

The Cope Representative in your territory will be glad to explain the new coupler and show you samples so that you can have the advantage of this latest Cope development in your next new construction program or plant modernization project.

Write today for the new Cope Bulletin which illustrates and describes the New Cope Cable Trough with the built-in coupler. Ask for Bulletin 1-2.

Severance gets Florida Sta-Brite sales post

APPOINTMENT of John D. Severance as their sales engineer for the State of Florida has been announced by Nat Furman of Sta-Brite Fluorescent Manufacturing Co., Miami, Fla. Mr. Severance

John D. Severance

will make his headquarters at 2901 28th St., N., St. Petersburg, Fla.

A former sales representative for the Edwin F. Guth Co., Mr. Severance was the lighting engineer for the Iowa-Illinois Gas & Electric Co., from 1945 to 1953. He attended the mechanical and engineering schools at Iowa State College and the University of Minnesota. He is a member of the Illuminating Engineering Society.

L & P Utilities holds successful sales meeting

THE MOST SUCCESSFUL sales meeting in the history of Light & Power Utilities Corp., was held at the Memphis, Tenn., plant December 11, Murray Reiter, L & P president, has announced. Attending were 26 men from nine cities.

One of the high spots of the day-long program was a tour of the Light & Power plant, where fluorescent fixtures are made from start to finish, beginning with the making of the dies themselves. Other highlights included a history of the company's origin and growth, a tour of a big L & P installation at the Humko Co., a demonstration of the entire L & P line, a presentation of the advertising campaign planned for 1955, a discussion of sales methods and aids, and a question and answer session. A gala dinner wound up the full and busy day.

Attending from W. J. Milner & Co., Atlanta, Ga., were W. J. Milner and Bill Miller; from Columbia, S. C., was N. W. Trowbridge; R. B. Baldwin from Norfolk, Va.; and John Irvin, Nashville. T. B. Owen represented Craig-Owen Co. of Chattanooga, Tenn.; C. K. Ramond and Bruce Ashley came from C. K. Ramond Co., New Orleans, La.; and C. V. Hammon from Oklahoma City, Okla.

Billy Blakemore, Billy Murphey, and Kelcie Hamm represented Orgill Bros., of Memphis; and W. B. Davis, Sr., W. B. Davis, Jr., T. J. Mason, J. C. Gammon and W. R. Davis represented W. B. Davis Electric Supply Co.

Others present were Joe Featherstone and Bill Garibaldi, both of Oattis Electric Supply Co.; Hal Beard, Jr., of Memphis; Murray Reiter, Marshall Lewis, Nathan A. Tamm and Floyd Wilson, all of Light & Power; and Ernest Lee and Dr. R. M. Cooper of Merrill Kremer, Inc., L & P's Advertising Agency.

Stanley enlarges Southern operations

WITH THE APPOINTMENT of three new Southern sales representatives, Stanley Electric Manufacturing Co., with main offices in Philadelphia, has enlarged its operations in the Southern territory.

Recently appointed representatives are Perry G. Sessoms, 735 Spring St., N. W., Atlanta, Ga.,

Floyd H. Goodman

who will represent Stanley in the State of Georgia; John Miles, 9 Central St., Pine Castle, Fla., who will cover the State of Florida; and Floyd H. Goodman, 373 Moreland Ave., N. E., Atlanta, Ga., who will represent Stanley Electric in the States of North and South Carolina, Alabama, Tennessee, Louisiana and Mississippi.

These new representatives will work through and with Bernie Bierman, manager of Stanley Electric's Southern branch office and

plant at 950 Ashby St., N. W., Atlanta. All shipments in the Southern area will be made from the Atlanta warehouse.

I. William Heller, president, Jack Smolens, vice-president, Ronnie Taylor, Lewis Kaplan, and Ben O'Dessa, all of Stanley Electric's main office in Philadelphia, recently spent two weeks in the South going over the new territory and the Stanley line with the newly appointed sales representatives.

Butcher addresses Arkansas contractors

ERNEST BUTCHER, president of the Northeast Texas Chapter of the National Electrical Contractors Association, was the featured speaker at the recent annual convention of the Arkansas Chapter, which was held in Little Rock.

Mr. Butcher, well known among Southwestern electrical contractors for successful operation of two-way radio emergency service trucks, also participated in several panel discussions during the Arkansas contractor meeting.

Albert Korenblat, president of the Arkansas Chapter of NECA, and owner of the I K Electric Co., Little Rock, named Ellis Fagan, owner of Fagan Electric, also of Little Rock, as chairman of arrangements for the meeting.

Other officers of the Arkansas Chapter are Lee Harvill, Harvill-Byrd Electric Co., Little Rock, chapter governor and vice-president, and Ollie V. Rains, Rains Electric Co., Hot Springs, treasurer.

Walker named member of NAW executive committee

CLARENCE C. WALKER, vice-president and general manager, General Electric Co., Construction Materials Division, Bridgeport, Conn., has been named a member of the National Adequate Wiring Bureau Executive Committee. This is an electrical industry operating group which directs adequate wiring promotion on a country-wide basis.

Mr. Walker is acquainted with local electrical industry problems in many parts of the country. The division for which he is responsible operates plants at Oakland, Calif., New Kensington, Pa., Lowell, Mass., Providence, R. I., Norfolk, Conn., and Bridgeport, Conn.

Associated with his firm since 1921, he has served the company in various sales capacities since that time, becoming a commercial vice-president in 1947 assigned to customer relations work in New England. His appointment as-vice-president and general manager of the Construction Materials Division, Bridgeport, followed in 1948.

Brock heads Atlanta Locke Department office

A NEW DISTRICT OFFICE of the Locke Department of General Electric was opened in Atlanta, Ga., recently and Louis M. Brock, formerly of Jacksonville, was appointed manager.

Announcement of the expansion of G-E's insulator and line hardware department was made by Hubert M. Carmichael, regional manager, at a Southeastern sales meeting held in Atlanta.

Mr. Brock, who will be responsible for sales in Georgia and Florida,

L. M. Brock

will have his office in the Red Rock Building, 187 Spring St., N. W., Atlanta.

Mr. Carmichael also announced the opening of a new district office in Charlotte, N. C., to service the States of North and South Carolina and Virginia, all of which, along with Kentucky, have recently been added to the Southeastern region.

Carl Forsyth, formerly of Richmond, Va., was named district manager for the Charlotte office.

Those in attendance at the meeting were A. B. Caprara, district manager, New Orleans; Roy T. Anderson, district manager, Nashville; L. M. Brock, district manager, Atlanta; Charles C. Bullock, field representative, Atlanta; Carl Forsyth, district manager, Charlotte; and Charles B. Vaughn, manager, sales and sales planning, Baltimore.

Circle F purchases Eastern Insulated Wire

HERMAN B. RING, president of the Circle F Manufacturing Co., Trenton, N. J., manufacturers of electrical wiring devices, has announced that his company has purchased the Eastern Insulated Wire Corp., Wallingford, Conn.

With the purchase of this corporation, basic manufacturers of rubber, neoprene, asbestos, plastic and braided wires and cords, 51-year-old Circle F is now in a position to supply complete wiring and electrical devices for industrial and home appliance use. In addition to the newly acquired wire and cord company, Circle F also operates its own porcelain factory, plastics factory, screw manufacturing plant, tool and die plant and press department, as well as complete assembly factory.

According to Edward A. Ring, vice-president of Circle F, and newly elected president of Eastern Insulated Wire, the present management of the wire firm will remain unchanged. Lawrence Feldman will continue to serve as vice-president and general manager, and Edward Cook will serve as vice-president and factory manager.

Mr. Ring reported that plans are being made to increase, immediately, the sales force, and expansion of the plant facilities is already underway.

Protective Relay Engineer Conference scheduled

THE EIGHTH ANNUAL Conference for Protective Relay Engineers has been scheduled by the Department of Electrical Engineering, Agricultural and Mechanical College of Texas, College Station, Texas.

Conference dates this year are April 25, 26, and 27, according to L. M. Haupt, conference chairman. Further information on the conference is available by writing to Mr. Haupt at the college.

Berko names two Southern sales representatives

ANNOUNCEMENT of the appointment of two new Southern sales representatives has been made by the Berko Electric Manufacturing Corp., Queens Village, N. Y., manufacturers of glass radiant heating products.

William Brock, 2422 Alamo St., Dallas, Texas, has been named to represent Berko in the States of Oklahoma and Texas, East of the Panhandle section.

The S. C. Stockdale Co., 1032 Boulevard, N. E., Atlanta, Ga., has been appointed to represent Berko in the States of Georgia, Tennessee, and Alabama. Four individuals operate the Stockdale organization, which has represented manufacturers in the Southeastern territory for the past 25 years.

Orlando Armature Works named A-C service shop

THE ORLANDO Armature Works, Inc., 600 West Central Ave., Orlando, Fla., has been named a certified service shop for Allis-Chalmers motors, controls and transformers in eight central Florida counties.

Area served by the firm, which was established in 1926, includes the counties of Orange, Seminole, Brevard, Osceola, Volusia, Lake, Marion, and Sumter.

G-E's Locke Department drops pole line hardware

THE LOCKE DEPARTMENT, General Electric Co., has announced the withdrawal of pole line hardware from its product scope, effective since January 1, 1955.

G. A. Goddard, manager of marketing of Locke, explains that this step will free the department to concentrate its development, manufacturing and marketing resources on serving its customers with porcelain insulators, their associated line hardware and apparatus bushings.

News about people

Orangeburg Manufacturing Co., Orangeburg, N. Y., manufacturers of conduit and drain and sewer pipe, has appointed **Frank P. Carlin** advertising manager of the company. Mr. Carlin joined the company's sales division in 1950. He previously was with Cuneo Press and with the advertising production department of the *New York Sun*.

Several major changes in assignments of sales personnel of **Chase Brass & Copper Co.** (subsidiary of Kennecott Copper Corp.), have been announced by **Bruce A. Dean**, vice-president in charge of sales.

A. Reece Hooks, Jr. succeeds **Herman H. Herring** as district manager at Atlanta, Ga., while Mr. Herring is transferred to New Orleans. Mr. Hooks, who has been a salesman in the Chase Atlanta district since 1948, is a graduate of Georgia Institute of Technology. He has been with Chase since his graduation in 1939, and is well known throughout this territory.

Joseph M. Jolley succeeds **John M. Gehl, Jr.** as district manager in New Orleans, La. Mr. Gehl will devote his full time hereafter to his responsibilities as Southern regional manager, in which capacity he supervises Chase district sales offices and warehouses in Houston, Dallas, Atlanta and New Orleans. Mr. Jolley has been with Chase more than 20 years. For sometime he has been a salesman in New Orleans and is widely known throughout that territory.

Chase also has announced the establishment of a new district sales office in Charlotte, N. C., which will service most of North Carolina and South Carolina. **Herman H. Kremer**, formerly connected with the Indianapolis, Ind., Chase sales district has been appointed district manager. This new district will be added to the Southern region and will be under the general supervision of Mr. Gehl.

L. O. Bradshaw, director of **Mississippi Power & Light Company's** development department, was recently elected to the Southern Industrial Development Council's board of directors at its ninth annual conference meeting in New Orleans. Mr. Bradshaw, who will represent Mississippi on the board, succeeds **Fred Plummer**, manager of the development section, **Mississippi Valley Gas Co.**

Perry G. Sessoms, Jr., 735 Spring St., N.W., Atlanta, Ga., has recently been appointed district manager for the **Electro Silv-A-King Corp.**, Chicago, manufacturers of commercial and industrial fluorescent and incandescent lighting fixtures. His District will encompass Georgia, Alabama, (excluding Mobile-Gulf Area), Central Tennessee, and Greenville and Anderson, S. C.

Perry G. Sessoms

QUALITY *is* *not* EXPENSIVE

INSIST ON

AMERICAN *Bonded* ARMORED CABLE

The extra quality you get with American Bonded Armored Cable costs no more — but that extra quality means a better installation. American Bonded is more flexible and easier to handle. Ask for it by name.

AMERICAN METAL MOULDING CO.

146 Coit St. Irvington 11, New Jersey

Atlanta Warehouse
C. C. MYRICK
516 Elm N. W.
Atlanta, Georgia

Dallas Warehouse
PEABODY BROTHERS
3015 Taylor Street
Dallas, Texas

Mr. Sessoms studied engineering and electricity at Maryville and Colorado Colleges. He is well known to the architects, contractors, power companies, and electrical distributors in his territory as he has been contacting them for many years, both as a salesman and lighting specialist. His most recent connection before organizing his own company was with the L. Morris Landers Co., Atlanta, as lighting specialist, handling lighting equipment exclusively and traveling five Southeastern states.

Paul J. Puckett has been named manager of the Chesapeake lamp sales district of the **Westinghouse Lamp Division,** it was announced in Baltimore recently by **G. W. Howson,** Atlantic regional manager.

In his new posistion, Mr. Puckett will direct lamp sales in a territory

P. J. Puckett

including greater Baltimore, all of Maryland, and parts of West Virginia and Virginia.

A native of Lebanon, Va., Mr. Puckett joined the Westinghouse lamp division in 1947, and prior to his new assignment served in the Roanoke sales office.

George E. Herrmann, of Bellmore, N. Y., has been named office manager of the **American Institute of Electrical Engineers,** succeeding **Floyd A. Norris,** who has retired after half a century of service, **N. S. Hibshman,** institute secretary, has announced.

Mr. Herrmann formerly was chief accountant and assistant office manager of the American Institute of Mining and Metallurgical Engineers.

Mr. Norris first became affiliated with AIEE as a boy in 1904, when the Institute staff consisted of 10 members and the membership was 3,027. Today the membership is more than 48,000, with an office staff of 58.

The board of directors of **Porcelain Products, Inc.,** has elected **G. M. Ruoff** to the post of executive vice-president of the company. Mr. Ruoff

The VITAL Link

TRADE ARRO MARK

MAKER — DISTRIBUTOR — USER

between

maker and user

ARRO Over the years, QUALIFIED Distributors have earned an important position in the distribution chain. They've gained recognition as a VITAL LINK in America's industrial economy. This recognition has been earned for one reason . . . performance.

ARRO Arro Distributors have grown both in numbers and in volume of business — because they handle an essential job in the most efficient manner. Briefly, Arro Distributors provide quality distribution at a minimum cost to the user.

ARRO For twenty-five years, Arro Expansion Bolt Company has worked with and through Qualified Distributors — because we feel that Arro users will receive faster and better service at less cost . . . than is possible in any other way.

TRADE ARRO MARK

ARRO EXPANSION BOLT CO.

1320 Boone Ave., MARION, OHIO

Manufacturing a complete line of Anchoring and Drilling devices and related products for fastening to masonry

See your industrial, hardware or electrical supplier

previously was vice-president and general manager of the company's High Voltage Insulator Division at Parkersburg, W. Va.

He will now assume full authority and responsibility for the operation of the entire company, which includes the Low Voltage Division at Findlay and Carey, Ohio, as well as the High Voltage Division.

John G. Loy, who has been very ill, will continue as company president.

Three important management changes in the **Graybar Electric Company's** Texas organization were announced recently by **W. E. Henges,** Graybar's President.

V. R. Young, formerly manager at Fort Worth, has become district sales manager with headquarters at Dallas. Mr. Young has completed 28 years with the company and has had a wide experience including jobs as assistant manager, lighting sales at headquarters in New York; manager, line material at Boston; manager, line material and power apparatus at Dallas and he also headed up Graybar's Telephone, signaling and electronic activities in the Dallas district before becoming Forth Worth Manager.

C. C. Ross has become Graybar's Fort Worth manager. He has been with the company for 17 years and has worked as a salesman; manager of broadcasting sales; manager of telephone sales; manager of outside construction sales and manager of communication sales at Dallas. During the war he was at Harvard Radio Research Laboratory working on radio equipment development for the Armed Services.

H. J. Frantz, who was recently made sales manager at Graybar's Austin office and warehouse, now becomes manager at Austin. Starting with Graybar in July of 1940, Mr. Frantz has worked in the service and stock maintenance departments. He served in the Pacific Theatre in the Air Force for 18 months and returned to Graybar as operating manager at Fort Worth. Later he became supply salesman at the same location that he will now manage.

Kenneth R. MacLean was recently appointed general sales manager of the **Crescent Co., Inc.,** a subsidiary of the Penn-Texas Corp., of Pawtucket, R. I., manufacturers of insulated wire and cable.

Mr. MacLean joined the Crescent organization in 1950 in the capacity of field sales manager of the Automotive Division. In 1952 he was made sales manager of this division. For the past year he has been active in the organization of a new industrial sales force selling the company's products in the electrical manufacturing and wholesaling fields.

Howard D. Tindall has been appointed manager of the Transformer Division of **Federal Pacific Electric Co.,** Newark, N. J., it was announced recently by **Thomas M. Cole,** executive vice-president. His duties will include the management of Gardner Electric Manufacturing Co., San Francisco, a wholly-owned subsidiary of Federal Pacific.

Mr. Tindall was associated from 1940 until his present assignment with Moloney Electric Co., where he was a vice-president and assistant chief engineer. Previously, he had been division engineer of Moloney's Distribution and Specialty Transformer Division, and before that, section engineer of the Distribution Transformer Section.

Dr. Samuel G. Hibben, former director of applied lighting for the lamp division of the **Westinghouse Electric Corp.,** and a past president of the Illuminating Engineering Society, has retired from Westinghouse after nearly 40 years of service to the lamp and lighting industry.

An internationally-known authority on illumination, Dr. Hibben was born in Hillsboro, Ohio, and was graduated from the Case Institute of Technology in Cleveland with a

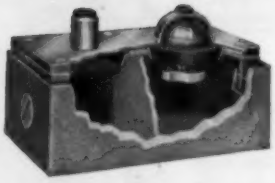
S. G. Hibben

bachelor of science degree in 1910. In 1914, Case awarded him the degree of electrical engineer for his study of light-controlling glassware, and he later took post-graduate work at the Carnegie Institute of Technology, Pittsburgh, Pa., and at the University of Paris, France. In 1952 Case Institute awarded him the honorary degree of Doctor of Engineering.

After operating an electrical contracting firm and working in Pittsburgh as a consulting engineer, Dr.

Latrobe PRODUCTS

FLOOR BOXES • WIRING SPECIALTIES



No. 252-R Two Gang Adjustable Floor Box

SERVE LONG AND WELL

Years of actual use have earned impressive leadership for "Latrobe" floor boxes and wiring specialties. You save time, money and worry by installing "Latrobe" products.

Floor Boxes • Cover Plates • Pipe or Conduit Hangers • Gang Boxes • Nozzles • Fish Wire • Cable Supports • Junction Boxes • Insulator Supports • Staples and Cable Clips

Write for New Catalog

Represented in the South by

CARY CHAPMAN & COMPANY
702 Whitehall St., S.W., Atlanta, Ga.
213 S. Front St., New Orleans 12, La.
445 English St., Greensboro, N. C.

F. P. WALTER COMPANY
4030 Chouteau Ave., St. Louis 10, Mo.

FRED H. SIMMER CO.
1406 S. Akard St., Dallas 1, Texas

FULLMAN MANUFACTURING CO.
LATROBE . . . PENNSYLVANIA

Hibben joined Westinghouse in 1915 as a meter design engineer. Later he became an arc-lamp specialist at the East Pittsburgh works and later an illuminating engineer at sales headquarters.

Dr. Hibben rejoined the Company in 1919 as a supervisor in the Cleveland lamp division office after serving as a Captain in the A.E.F. in World War I. He was soon called to Bloomfield, N. J., to develop a lighting service bureau that was the forerunner of the Westinghouse lamp division's present commercial engineering department.

Joe L. Booker, formerly district lamp and lighting specialist for General Electric Supply Co., Nashville, Tenn., has joined **Day-Brite Lighting, Inc.,** St. Louis, Mo., as Southern sales manager.

A native of Nashville, Mr. Booker was educated at Vanderbilt University, and following graduation started with G-E in Schenectady, N. Y., as a student engineer. He

Joe L. Booker

served with G-E at Nela Park, Cleveland, and in Pittsburgh before assuming the position he held until recently with G-E Supply.

Mr. Booker is a member and past president of the Engineering Association of Nashville; a member and past chairman of the Tennessee Valley Section of I. E. S.; and a registered licensed engineer in the State of Tennessee.

As Southern sales manager for Day-Brite, Mr. Booker will occupy offices at 1714 Hayes St., Nashville 4, Tenn.

BullDog Electric Products Co., Detroit, a Division of the I-T-E Circuit Breaker Co., Philadelphia, has announced that **Henry C. Egerton,** treasurer, has been appointed vice-president in charge of its newly organized Business Management Division. **Carl J. McAdams,** assistant treasurer, has been appointed treasurer and **Edward J. Colosimo,** accounting manager, has been appointed controller.

"when I have to get into my wireways

I'M GLAD I INSTALLED B&C HINGED COVERS!"

Say Plant Superintendents in today's busiest factories

B&C HINGED COVER WIREWAYS

ACCESSIBILITY *plus* **CAPACITY**

unequalled by any other type of wiring trough

Almost any wiring combination is possible with these B&C Wireways. It's no wonder they're specified again and again by both electricians and plant men. They give greater protection and save time when wiring has to be changed, tapped or spliced frequently. Extensions and rerouting are made simple and easy with B&C Type "HCW" Wireways.

Die formed from heavy gauge steel, as specified by the Underwriters Laboratories and the National Electrical Code. Hard light grey enamel finish. Standard knockouts. Extra rigid construction.

Write for complete catalog data, sizes and specifications.

UL B and C

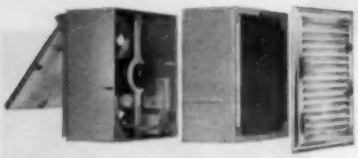
METAL STAMPING CO.

590 MEANS ST., N. W., ATLANTA, GEORGIA

Your Seals of Dependability and Safety

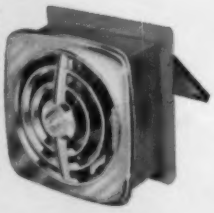
Broan

LEADS with Motordor EXHAUST FANS



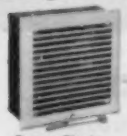
Motordor Automatic Fans in 12", 10" and 8" sizes

No other Exhaust Fan has all of the BROAN Motordor features. No. 11C Fan (10") with "FANTOM GRIL" and No. 840C (8") with Venturi-Design grille are illustrated. Fan motor and Outer Door motor both are controlled by a single switch for automatic operation.



Why BROAN Exhaust Fans are preferred

Every modern advance in home ventilation is represented in today's complete line of BROAN Ventilating Fans. In addition to the fully automatic MOTORDOR Fans, the BROAN line includes 8", 9", and 10" Chain Control Wall Fans, and 8" and 10" Ceiling Fans — adapted to every possible installation requirement in kitchens, bathrooms, nurseries, recreation and utility rooms, regardless of size.



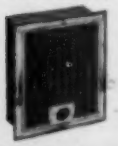
Broan Chain Control Fan with "FANTOM-GRIL"—No. 6C

"FANTOM-GRIL" is exclusive

"FANTOM-GRIL", the only grille that conceals fan interior from view, makes possible the greater volume and efficiency of airflow.

Broan 8" Ceiling Fan No. 872

Distinguished by modern design, top-ranking quality, and an outstanding quarter-century record of satisfactory service in hundreds of thousands of homes, BROAN equipment . . . including fan-type electric heaters . . . is recognized as the leading preference of Architects, Electrical Contractors, Builders and Homeowners.



Broan Electric Heater No. TU-15, Thermostat Control.

Write today for FREE 1955 Catalog

BROAN MFG. CO., INC.

1671 NORTH WATER STREET

MILWAUKEE 2, WISCONSIN

Free bulletins

available to our readers

Anaconda Wire & Cable Co.'s recently issued normal-size **Magnet Wire Catalog** (C-79-12) now has a "little brother," for the company has duplicated the large catalog exactly in a new convenient, pocket-size form. Nothing is changed except the number of the miniature version, which is designated C-79-12A.

The digest-size catalog is as complete in all details as its "big brother." It is completely and conveniently indexed, and is illustrated with extremely readable charts, tables, drawings and photographs.

For a copy of the new easy-to-carry Magnet Wire Catalog C-79-12A write on company letterhead to E. Fred Luna, director of sales promotion, Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.

For your free copy, circle number B201 *on the coupon on page* 76.

How bus duct meets industry's demand for more flexible power distribution, is described and illustrated in a new 24-page comprehensive bulletin No. 300 on "Plug-Duct" by **Continental Electric Equipment Co.,** Box 1055, Cincinnati 1, Ohio.

Innovations in Continental "Plug-Duct" include various design changes aimed at increased safety and ease of installation.

Connections of 10-foot lengths of duct which can be made from either side, as well as the types of tap boxes, end closers and plug-in units employed, are shown. "Plug-Duct" hangers permit installation in any plane to reduce installation time, and avoid necessity for pre-engineering their locations. Elbow, tee and cross fittings are also shown, as well as transformer taps, flanges and switch board stubs. Complete application and dimensional data plus specifications are included.

For your free copy, circle number B202 *on the coupon on page* 76.

New, higher RLM Standard Specifications on both incandescent and fluorescent industrial lighting units have been established effective October 1, 1954. These new standards take recognition of industry's ever-increasing demand for more light, both on working surfaces and ceilings; better shielding; increased efficiency; easier and lower-cost maintenance and make the RLM Label on lighting equipment more important than ever to buyers who want quality lighting equipment.

A complete compilation of all new **RLM Specifications** is now being printed. It covers 46 different types and sizes of incandescent and fluorescent industrial lighting units, now qualified to bear the RLM Label. Advance reservations for copies of this new 1955 RLM Specifications Book are now being accepted by the **RLM Standards Institute,** Suite 818, 326 W. Madison St., Chicago 6, Ill.

For your free copy, circle number B203 *on the coupon on page* 76.

How **Allis-Chalmers protected distribution transformers** help the utility is told in a new eight-page bulletin released by the company.

Operating advantages of the transformer, available in ratings of three kva through 100 kva, 2400 to 14,400 volts, and mechanical data on the five type designations are also given, along with a typical load-time curve for one of the units to show how the integral breaker increases useful capacity.

Copies of the bulletin, "Allis-Chalmers Protected Distribution Transformers," 61B7309B, are available on request from Allis-Chalmers Manufacturing Co., 938 S. 70th St., Milwaukee, Wis.

For your free copy, circle number B204 *on the coupon on page* 76.

A six-page, two-color, descriptive brochure, which fully describes the Electrend **electric circulation air heating system,** is available from **Electrend Products Corp.,** St. Joseph 2, Mich., manufacturers of the line.

For your free copy, circle number B205 *on the coupon on page* 76.

The Brewer-Titchener Corp., Cortland, N. Y., manufacturers of high-voltage transmission line hardware, has recently issued 14 supplementary pages for their **hi-line hardware catalog,** copies of which are available free of charge.

The new BTC catalog supplements contain blueprints and complete specifications on revisions and additions to the firm's line of drop-forged steel and aluminum hi-line hardware.

Also, the firm announces, a complete, revised copy of the BTC hi-line hardware catalog will be sent to all persons requesting it.

For your free copy, circle number B206 *on the coupon on page* 76.

Through the medium of Trans-Vision pages, all design features of a new line of **distribution transformers** are revealed in a new booklet (B-6403) available from **Westinghouse Electric Corp.,** Box 2099, Pittsburgh 30, Pa.

In addition to a pictorial treat-

ment, the principal features of the new single phase, three to 167 kva, pole type transformers are discussed in detail, and grouped conveniently in several sections. These sections include: corrosion resistance, sealing, and installation, operation, and maintenance.

For your free copy, circle number B207 *on the coupon on page* 76.

Samples and specifications of the new **parallel wiring outlet** with 14 gage, 80 degree C. UL approved leads of 12 inch lengths and the "pre-wired" and "solder tab" mini-spACe outlets, UL approved for 15 amps at 125 volts and 10 amps at 250 volts, are being offered by the manufacturer, **Alden Products Co.,** Brockton 64, Mass.

For your free copy, circle number B208 *on the coupon on page* 76.

Complete information, including catalog sheets, price and specification sheets, on their full line of **stationary power roof ventilators** is being offered by the **Uno Ventilating Co.,** 1236 Eastern Ave., Malden, Mass. The line features the Uno-Venturette aluminum, power roof ventilators; turbine ventilators; stationary ventilators; the Uno "Power-Pac"; and the Uno turbo-base, motorized ventilator.

For your free copy, circle number B209 *on the coupon on page* 76.

Victor Ventilator Division of the Philip Carey Manufacturing Co., Middletown, Ohio, is offering copies of a new two-color, well illustrated booklet showing their complete line of **ventilating fans,** commercial exhaust fans, electric bathroom heaters, and accessories for ventilating fans. The booklet contains complete descriptions and specifications of all items in the Victor line.

For your free copy, circle number B210 *on the coupon on page* 76.

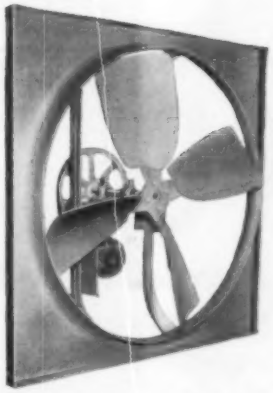
Bulletin 1411, which describes their new **100 ampere circuit breaker safety switch,** in a space-saving enclosure which occupies about half of the space required by comparably rated fused switches, is available from **Heinemann Electric Co.,** 431 Plum St., Trenton 2, N. J.

For your free copy, circle number B211 *on the coupon on page* 76.

A new booklet (GEA-6126) describing the general design features of G-E **self-protected pole-type distribution transformers** rated 100 kva and below has been announced as available by the **General Electric Co.,** Schenectady 5, N. Y.

The 24-page, two-color bulletin, gives detailed information for urban and suburban applications, explain-

THIS BOOKLET WILL HELP YOU C-O-O-L MORE HOMES *profitably!*



BREEZ-AIR, the "QUIET" attic fan to install! Husky, high in efficiency. RELIABLE PERFORMANCE RATINGS — certified by Standard Test Code of PFMA, NAFM and American Society of Heating and Ventilating Engineers.

More home owners than ever are going to want the cool comfort BREEZ-AIR ATTIC FANS can bring them! This booklet shows how easy it is to figure fan size for each home—shows you a wide choice of ways you can install versatile BREEZ-AIR FANS (see three ways below)—gives you quick facts on proper size of discharge opening, type of louvers, automatic controls and all price data. Write for your copy of FM215 **today** and enjoy a good, profitable business with these fans backed by the "Q" Factor—**the built-in Quality which provides trouble-free satisfaction and long life.** It's Quality that has made "Buffalo" Fans popular for 78 years!

Horizontal mounting in attic floor

Vertical mounting in attic penthouse

Vertical in wall, grille in floor

"Buffalo"

BUFFALO FORGE COMPANY

210 Mortimer St. Buffalo, N. Y.

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

Industrial Exhausters Belted Vent Sets Propeller Fans "E" Blowers-Exhausters

ing how internal circuit breaker design allows full use of transformer capacity and gives good overcurrent protection.

For your free copy, circle number B212 *on the coupon on page* 76.

A complete new catalog, featuring quality **electric products for home and industry,** has been announced by the **Royal Electric Co., Inc.,** Pawtucket, R. I. The colorful catalog contains complete indexed sections of Royal's fuses, wiring devices, cord sets, trouble lights, extensions, wire, cord assemblies, and decorative Christmas lighting.

For your free copy, circle number B213 *on the coupon on page* 76.

How to select a magnetically or mechanically held relay is shown in a new publication, **"Relay Selection Tabulations."** This publication may be obtained by writing to the **Automatic Switch Co.,** 391 Lakeside Ave., Orange, N. J., and requesting ASCO Publication No. 553.

Circuit diagrams for two wire control, stop-start three-wire maintained control, and thermostatic control for magnetically held relays are supplied. Diagrams for mechanically held relays include monentary contact, push-button control, maintained contact control, and rachet relay equivalent operation.

For your free copy, circle number B214 *on the coupon on page* 76.

Micro Switch, Freeport, Ill., a division of Minneapolis-Honeywell Regulator Co., has announced their new **Catalog No. 62** on precision snap-action basic switches.

This 28 page, two-color catalog describes 10 classifications of the standard line of Micro Switch phenolic enclosed, precision snap-action basic switches, including those with high electrical capacity, high sensitivity, single-pole, double-pole, double-break and split-contact arrangements, magnetic blow-out and make-before-break switching elements, and those with sealed construction. Over 400 listings of basic switches, auxiliary actuators and terminal enclosures are covered.

For your free copy, circle number B215 *on the coupon on page* 76.

A new 16-page brochure entitled **"Acusti-Luminous Ceiling — The Ceiling That Works For You."** thoroughly describes and illustrates this innovation in lighting. Offered by **Luminous Ceilings, Inc.,** 2500 W. North Ave., Chicago 47, Ill., the book is printed in black, beige, and turquoise blue with illustrations.

There are many illustrations throughout the book, such as, before and after pictures of many installations of luminous ceilings; a page showing various designs that are possible with an Acusti-Luminous ceiling; a series of pictures showing the actual Underwriters' test of the ceiling; and, a complete diagram of installation instructions of luminous ceilings.

For your free copy, circle number B216 *on the coupon on page* 76.

A new 24-page bulletin, No. 501, describing a complete line of **lighting and distribution panelboards for industrial and commercial use** is announced by **Continental Electric Equipment Co.,** Box 1055, Cincinnati 1, Ohio.

Federal specifications are given as they relate to Continental circuit breaker and fusible type panelboards. All panelboards are illustrated, and construction design and application features are given as well as ratings, weights, dimensions, and knockout arrangements.

For your free copy, circle number B217 *on the coupon on page* 76.

A factually illustrated four-page bulletin on the new **Buchanan pres-SURE-block** is now available from **Buchanan Electrical Products Corp.,** Hillside, N. J. Bulletin PB describes these new sectional terminal blocks in detail, including the three types of factory installed contracts available in either factory assembled blocks or in complete sections for user's assembly. New literature also describes pres-SURE-pin construction which allows an unlimited number of circuit sections to be securely assembled to any desired length without the inherent disadvantages of conventional sectional blacks having fastening hardware or loose fitting sections.

For your free copy, circle number B218 *on the coupon on page* 76.

A new catalog, No. 600, illustrating their line of **electrical products and wiring specialties,** is available from the **Fullman Manufacturing Co.,** Latrobe, Pa. The catalog covers adjustable and non-adjustable floor boxes, junction boxes, gang boxes, and principal accessories.

For your free copy, circle number B219 *on the coupon on page* 76.

"How to Select and Use Today's Electrical Connectors" is the subject of Burndy Technical News Letter 24, recently published by **Burndy Engineering Co., Inc.,** Norwalk, Conn.

This nine-page technical bulletin contains two major articles on the design of electrical connectors and their efficient application in modernizing industrial plants' electrical

BERKO

THE GLASS ELECTRIC HEATING PANELS SOLD EXCLUSIVELY THROUGH ELECTRICAL CONTRACTORS

BERKO leads in engineering, advertising, sales. To get your share of the increasing demands for radiant heating,

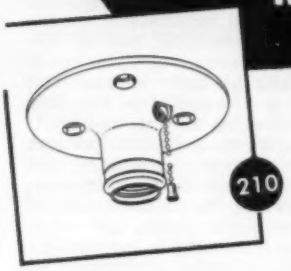
write to BERKO today for free computation manual —

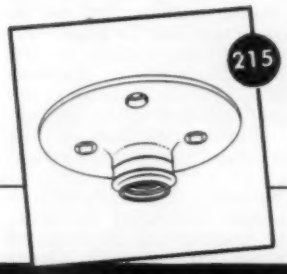
BERKO ELECTRIC MANUFACTURING CORPORATION

212-40 Jamaica Ave., Dept. ES-2, Queens Village 28, N. Y.

REPRESENTED BY . . . **J. S. McGee,** 525 W. 26th St., Norfolk, Va., **Clyde Mims & Assoc.,** P. O. Box 2692, Myrtle Beach, S. C., **Mr. S. C. Stockdale,** Stockdale Corp., 1032 Boulevard N. E., Atlanta, Ga., **Frank Moos,** 5709 Taliaferro St., P. O. Box 8391, Tampa 4, Fla., **I. Stephen Warner,** 1770 Rousslin Drive, New Orleans, La.

A STANDARD MASSEY OVERSIZE Bakelite RECEPTACLE for your need!





There's a big profitable market for these two Massey high quality electrical wiring devices because they are practically indestructable, lightweight, easy to handle, low in cost and economical to use. Both 5" dia. listed by U. L. Inc. Meet Fed. Spec. W-L-142. Designed for use with 3¼" and 4" Boxes. Grooved for shade holders.

210—Brown & Ivory—Removable Interior, Medium Base. 250 Watt—250 Volt.

215—Brown & Ivory—Medium Base. 660 Watt—250 Volt.

Write for complete catalog

A. H. MASSEY, INC.
P. O. Box 206 Derby, Conn.

Single and Multi Gang Wall Plates and Electric Wiring Devices Since 1936

for the LONG PULL use Y-ER EAS Wire Pulling Lubricant

Only Y-ER EAS has all these features

- Creamy, non-corrosive lubricant. Never greasy or messy.
- Prevents sticking or setting. Specially helpful on saddles and turns.
- Does not run back on cables.
- Never harmful to hands or clothing.
- Permanently non-harmful to cables or conduit.

Write for descriptive booklet

GIVES THE SLIP TO— Lead, Rubber, Braid or Synthetic Covered Cables

Improved Y-ER EAS tested and approved by the Underwriters' Laboratories, Inc.

AT ALL LEADING ELECTRICAL SUPPLY HOUSES

ELECTRO COMPOUND CO.
4145H W. 150th Street • Cleveland 11, Ohio

ONLY ELECTROMODE ALL ELECTRIC HEATERS have all 3

Triple Assurance With . . .

A Combination That Can't Be Beat for HOME · OFFICE · FACTORY MORE PROFIT FOR YOU

- ✓ Quick, easy to install
- ✓ Minimum maintenance
- ✓ 100% efficient
- ✓ Automatic control
- ✓ Clean, fan-circulated heat
- ✓ User satisfaction

100% SAFE

Hot resistor wires are insulated and embedded within a finned aluminum casting, assuring positive protection from fire, shock or burn. This finned type element acts as a superior heat diffuser, resulting in greater heating economy.

5 YEAR GUARANTEE
The patented, cast-aluminum heating element is guaranteed for five years against all defects of material or workmanship.

The Famous GE UNIT MOTOR

Totally enclosed construction protects motor from entry of dust. Large supply of oil sufficient for years of motor operation is factory-sealed-in. Forced lubrication system assures long life and quiet operation.

MODEL WJA

Everybody wants a toasty-warm, good-looking bathroom. The Electromode Automatic Wall-Type Bathroom Heater is the ideal solution. Choice of gleaming chrome or white enamel finish. 1520 watts.

MODEL WA

Heat big rooms with this modern design Electromode wall model with built-in thermostat for individual room temperature control. Down-flo principle distributes heat at floor level. Silver grey hammertone finish blends with furnishings. Capacities: 1500 to 4000 watts.

MODEL 14-10
Suspension-type Unit Heater

Electromode Unit Heaters in Suspension and Combination Portable and Suspension types solve hard-to-heat areas in the plant and isolated locations.

SAFETY SWITCH

Built into every Electromode Heater is a small thermal safety switch, located on or near the heating element. If for any reason the air flow should stop, causing overheating of the element, this safety switch automatically shuts off the current.

Approved by Underwriters' Laboratories

ELECTROMODE CORPORATION
45 CROUCH ST., DEPT. ES-25 ROCHESTER 3, N. Y.

Please send free literature on:
Electromode Heaters ☐ Domestic ☐ Industrial

NAME_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

distribution systems. With the aid of tabular data and illustrations, it shows how to evaluate the connector types for each application and class of use.

For your free copy, circle number B220 *on the coupon on page* 76.

Bulletin H-305A is now available from **Moloney Electric Co.,** St Louis 20, Mo. This bulletin is a revision of Bulletin H-305 and covers **HiperCore Distribution Transformers,** single phase, 15,000 volts and below, 167 kva and below. Particular emphasis is given in this bulletin to many new features in design.

For your free copy, circle number B221 *on the coupon on page* 76.

Elmo Metal Products Co., Inc., P. O. Box 1, 105-02 Metropolitan Ave., Forest Hills 75, N. Y., has announced that their new **price list No. 2-55** is now ready for distribution to the trade. Elmo Metal Products is a manufacturer and distributor of brass, steel, iron, aluminum, and plastic fittings and stampings for the incandescent and fluorescent lighting fixture, lamp and electrical industries.

For your free copy, circle number B222 *on the coupon on page* 76.

Technical books

for the electrical man

Lighting for Color and Form

By Rollo Gillespie Williams, Pitman Publishing Corp., 2 West 45th St., New York 36, N. Y., 340 pages, $8.50.

This book brings together a vast number of different but related branches of knowledge concerning lighting for the architect, scientist, designer, lighting technician, artist, engineer, display expert, photographer, and contractor. So that the specialist may easily find the material he wishes, the book is logically and conveniently divided into four parts: Light, Color Perception, and Rendition; Production and Control of Colored Light; Psychological and Aesthetic Factors; and Lighting Application Techniques.

Part I deals with the scientific factors underlying the subjects covered in the book, and includes the very latest information on additive color blending. Part II discusses the important characteristics and details of light sources and filters that are useful in the field of applied color, accent, and modeling work or for architectural, concealed or color lighting effects.

Part II defines some principles and rules for the artistic use of directional light, shade, and color. A chapter is devoted to psychological aspects of color in lighting — here as elsewhere in the book the author draws in large part on his wide experience. Part IV deals with the practical application of the principles discussed in previous chapters in relation to display, architectural, photographic, motion picture studio, television studio, stage, exterior, and photochemical lighting.

Mr. Williams, the author, is a Member and Fellow of the Illuminating Engineering Societies of the United States and Great Britain, respectively. He is famous on both sides of the Atlantic as a lighting designer and as the originator of numerous patents for lighting devices and techniques that have resulted in many new lighting systems. He is one of the world's leading authorities on mobile color lighting.

A Dictionary of Electronic Terms

Edited by Gordon R. Partridge, Ph.D, Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill., stock number 37 K 756, 72 pages, 25 cents.

A completely revised edition, containing over 3,500 terms used in television, radio, and industrial electronics, this new publication answers the need for an accurate, up-to-date reference source of words used in the rapidly expanding electronics field.

Definitions cover mostly modern techniques and equipment, but range from many words no longer in general use, retained for historic reasons, to the new language of color television and the electronics of nuclear physics.

Over 150 illustrations and diagrams of components, equipment, and electronic circuits are included.

Printed in handy six by nine inch, 72 page format, this new dictionary should prove very helpful as a reference guide for everyone interested in electronics.

BE SURE! USE M&W

watertight connectors

with new protection you need!

Now! A good connector with a conical compression ring that pulls up watertight, seals the tapered Neoprene bushing uniformly around the cable. Has extra take-up capacity, too.

LOW IN COST! HIGH IN PERFORMANCE!

Made in 2-screw or hex-nut types. Fit ¾" to 1¼" hub or knock-out; cable sizes from 10/2 to 2/3. Write for details and new Catalog No. 20-B.

Water-Tight Connectors — Non-Water-Tight Connectors — Service Entrance Kits — Service Entrance Caps, Straps and Sill Plates — BX and Romex Connectors.

Cut-away View

Shows new conical compression ring that seals bushing tight around cable.

M&W *Electrical Fittings*

The M. & W. ELECTRIC MFG. CO., Inc.

EAST PALESTINE, OHIO

New products

(For more information, use coupon on page 76)

Burndy line gets universal crimper

DESIGNED TO INSTALL all compression service connectors in the Burndy Crimpit line, the MD3 Hytool, recently developed by Burndy Engineering Co., Inc., Norwalk, Conn., is a lightweight, inexpensive hand-tool with four separate crimping grooves accommodating a wide range of conductor and connector sizes.

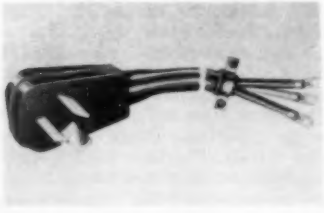
Weighing only eight pounds, and measuring 24 inches in length, the MD3 Hytool features a compound cam-and-toggle action that develops a high mechanical advantage and delivers 9,000 pounds of indenting force with a single stroke.

Sturdily constructed of high-strength steel alloys, short-handled, with rubber hand grips, the MD3 is also available with wooden handles.

For additional data, circle item 223 on the handy coupon on page 76.

Royal Electric offers molded dryer cord set

A NEW DRYER CORD SET has been added to the molded rubber cord set line of Royal Electric Co., Inc., according to an announcement from the company's general offices in Pawtucket, R. I. Made with an L-shaped grounding blade, for use with flush or surface receptacles with an L-shaped grounding slot, it is for dryers and other appliances and equipment which require only 30-amp service under NEMA standards and the new UL code.



The stock line includes lengths from 36 inches up, made with 3 No. 10 conductors. Rated at 30A-250V, this new cord set makes it unnecessary to overload the equipment because it is made especially for the lower service. The L-shaped grounding blade fits only the receptacle intended for it.

For additional data, circle item 224 on the handy coupon on page 76.

Bronco control cable features size variety

NEW FLEXIBLE control cables with from 5 to 24 conductors are now being manufactured in sizes 18 through 10 A. W. G. by Western Insulated Wire Co., Los Angeles 58, Calif.

Conductors in the new Bronco 60 Certified Control Cable are made of pure, annealed electrolytic copper for maximum flexibility and flex-life. Singles are coded with permanent colors.

The outer protecting jacket is certified by a registered professional engineer to contain not less than 60 per cent new Neoprene by weight —equivalent to 65.46 per cent by volume. This provides maximum protection against virtually all factors in the industrial environment which attack rubber. The jacket will not support combustion, and is branded every two feet.

The name, type, size, number of conductors, rated voltage, and "P116BM" (on sizes 14 and larger) —flameproof approval number of the U. S. and Pennsylvania Bureaus of Mines—are vulcanized permanently into the protecting sheath.

For additional data, circle item 225 on the handy coupon on page 76.

Federal Pacific producing improved safety switches

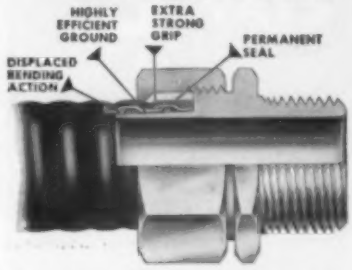
FEDERAL PACIFIC Electric Co., 50 Paris St., Newark, N. J., is producing a new and improved line of Type D (NEMA Type G) Safety Switches, in 30, 60, 100, 200, 400 and 600 amp capacities.

The 30 ampere line of type D safety switches has been redesigned to embody the same desirable plus features that make all Federal Noark switches easy to install and maintain, and guarantee long switch life. In addition, styling of enclosures is

New

LIQUID-TIGHT CONNECTOR

for flexible conduit



PYLE-NATIONAL

"CT" series Connectors offer all these advantages

EXTRA STRONG GRIP
- Compression force applied against body shank—not against the conduit alone, making a vise-like clamp.
- Gripping is well behind end of flexible conduit for firm anchorage.
- Pliable seamless sleeve makes a plastic-to-plastic grip with the conduit sheath . . . thereby avoids cutting and abrasion common to metal sleeves.

PERMANENT SEAL
- Plastic Sleeve and Conduit Sheath have equivalent physical characteristics therefore the seal will last the life of the conduit.

HIGHLY EFFICIENT GROUND
- Less than 10 millivolt drop.
- Tapered body shank, makes a firmly wedged contact with the flexible metal conduit.

DISPLACED BENDING ACTION
- Tapered body shank is elongated to extend beyond gland nut, thus avoiding short radius bends which shorten the life of the conduit sheath and the permanency of the joint.

"CT" series connectors can be installed assembled. Available in Straight, 45° and 90° types for ⅜" to 2" conduit. Meet U/L and J. I. C. standards.

SINCE 1897

Write for literature and names of authorized distributors in your area.

THE PYLE-NATIONAL CO.
1334 North Kostner Avenue
Chicago 51, Illinois

ELECTRICAL SOUTH
806 Peachtree St., N.E.
Atlanta 5, Ga.

February, 1955

Gentlemen:
Please send me the bulletins and catalogs or new product information as indicated.

(Print Plainly)

Name _____ Title _____

Company _____

Address _____

City & State _____

Circle numbers below. Bulletins, catalogs, or new product information will be mailed promptly.

B201	B202	B203	B204
B205	B206	B207	B208
B209	B210	B211	B212
B213	B214	B215	B216
B217	B218	B219	B220
B221	B222	223	224
225	226	227	228
229	230	231	232
233			

☐ Enter my subscription to ELECTRICAL SOUTH and bill me at the special rate of 3 years for $2.00.

FOR MORE INFORMATION — Use this handy return coupon for requesting manufacturers bulletins or additional information on new products listed in these pages. Be sure to give firm name and your position or title.

smart, modern, and uniform throughout the line.

These switches feature solderless lugs and feed-through neutral for quick installation. Ample gutter space is provided for ease in wiring. Visible knife blades insure safety, and all live parts are completely recessed to eliminate the danger of accidental contact.

Dual blade construction and fewer joints assure cool operation and trouble-free service. All moving parts and contacts are readily visible for inspection and maintenance.

Federal Noark Type D Switches are available in uniformly styled raintight enclosures with mounting ears that facilitate installation on posts and irregular surfaces. An indestructible metal nameplate containing complete switch data is mounted on the cover of every switch.

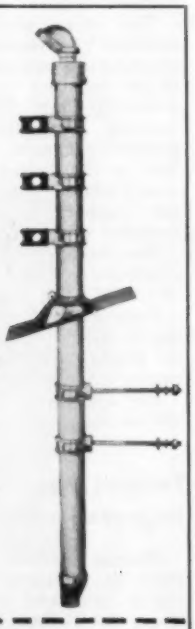
These switches are approved by Underwriters' Laboratories, Inc., and are suitable for use as service equipment.

For additional data, circle item 226 on the handy coupon above.

MAKE THE JOB

EASY

Blackhawk's complete service entrance mast fittings



Easy to sell! Easy to install! Blackhawk Industries Service Mast Fittings are available for either 2" or 2½" pipe riser. Built for sturdiness and rust free installations. All necessary fittings either individually or in kits. Write or ask for descriptive literature.

Blackhawk Industries

Dubuque, Iowa

Contact your nearest representative

Griffin & Griffin, Box 7374, Station C, 931 W. Peachtree St. N.E., Atlanta, Georgia

Kenneth H. Hill, P.O. Box 217, Mt. Dora, Florida

Lamps, Inc., 170 Express Street, Dallas 2, Texas

Onsrecker-Roberts Co., 2518 Times Blvd., Houston 5, Texas

S. T. Schooler & Co., 2616 N. Davidson St., Charlotte, North Carolina

Unimatic introduces 45° threaded angle connectors

NEW CONNECTORS, ⅜-inch—45 degree, for attaching armored cable to any threaded electrical outlets have recently been introduced by the Unimatic Corp., Route 22 & Koehl Ave., Union, N. J. Known as Harbot connectors, they greatly simplify installations of electrical switches, motors, junctions and fixtures. At the same time these connectors form a rigid fitting which protects wiring from damage at the point of entry to the housing. They are especially valuable in installations where vibrations exist, since they will not vibrate loose.

Harbot connectors are made of a special aluminum die-cast alloy. This model has three parallel ridges or serrations on the lip of each of the two halves. These serrations match standard ½-inch I.P.S. female threads in switch boxes, motor housings, condulets and the like. Operat-

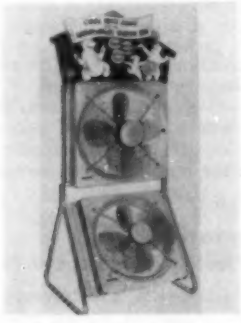
ing on a simple cam-wedge principle, it is possible to install this connector from the outside of the box or housing after the wiring hook-up is completed. Positive positioning of the cable connector assembly in any desired direction is assured when two standard machine screws are "pulled up home" on the cable. The only tool required is a screw driver — no washers or locknuts are necessary.

For additional data, circle item 227 on the handy coupon on page 76.

Robbins & Myers offers window fan display

THE FAN DIVISION of Robbins & Myers, Inc., 387 S. Front St., Memphis, Tenn., has announced a double display that holds two fans and permits them to be operated singly, or at the same time, to demonstrate air delivery.

This handsome display is made of polished aluminum tubing and durable Masonite, and carries silk-screen lettering in seven different colors. It stands 78½ inches high and is 34 inches wide and 26 inches deep. It is available through Robbins & Myers distributors under Catalog No. R-DC25/34.



The display is a modification of the 1953 chrome display, which was designed to demonstrate a single fan. The new display accommodates both 18 and 22 inch window fans.

For additional data, circle item 228 on the handy coupon on page 76.

Magni Flood marketing portable floodlights

A NEW LINE of portable floodlights is now being marketed by Magni Flood, Inc., 38 N. Second Ave., Mt. Vernon, N. Y. The complete new line has been developed to sell the feminine market.

The new lampholders are made of cast aluminum with a completely new glossy chrome-like finish called Aluma-Lite.

The Wonder-Lites are being packaged in a new four-color display box which features the light's many uses with illustrations.

For additional data, circle item 229 on the handy coupon on page 76.

Slater duplex receptacle ideal for replacements

DESIGNED TO MEET two circuit specifications, the new 393 two-wire, three-wire duplex receptacle recently announced by Slater Electric & Mfg. Co., Inc., 56th St. and 37th Ave., Woodside, N. Y., is ideal for both new construction and replacement requirements.

The combination of 3-2 wire Polarized duplex receptacle is recommended for use wherever grounding of portable tools and equipment is required and offers the added convenience of accepting parallel bladed caps used on appliances and housewares that do not require grounding.

At the same time, due to the two-circuit construction, 10 amp, 250 v, three-wire grounded or three phase systems can be accommodated for applications such as air conditioning or small three phase motors. Contacts are all double wipe; independent feeds.

The unit is UL and CSA approved and complies with the new NEMA and ASA codes. It is made to conform to rigid heavy duty specifications.

For additional data, circle item 230 on the handy coupon on page 76.

Buck Nycapper features increased versatility

A RECENT DESIGN change to the already versatile 8-1 Buck Nycapper is announced by the Buck Manufacturing Co., P. O. Box 147-249, Roselle, N. J. Originally introduced as an all purpose electrician's hand tool for the cutting, stripping and twisting of solid or stranded wire and the installing of the Nylon insulated Buck Nycaps on pigtail splices, the utility of this already efficient tool is now further increased by its ability to install solderless terminals.

The Nycapper's Tri-Dent crimping action can now be used on wire terminations. This action makes easy,

- COST
- CAPACITY
- SPACE

COST!

Save up to 25%. With the wide range of Furnas Electric starters to choose from, you don't have to waste money on starters too big for the job.

CAPACITY!

The many in-between sizes in the Furnas Electric line allow you to choose the control that is best suited for your particular job.

SPACE!

You can save up to 40%. By selecting the exact size starter for your requirements you get a starter that is more compact.

Write today for free 140-page Catalog 101 Furnas Electric Company, 1064 McKee Street, Batavia, Illinois.

FURNAS ELECTRIC COMPANY
BATAVIA, ILLINOIS
Sales Representatives in all Principal Cities

positive terminal installations of exceptionally high mechanical and electrical strength. Definite advantages over existing crimping methods, particularly where terminating solid wire, are gained from this new three-way crimp. Positive, controlled deformation of the wire, without reduction of the cross sectional area which was heretofore difficult to accomplish, is uniformly achieved by the Buck Nycapper.

In addition to the above improvements, Buck has announced that it will soon make available a new line of low cost Bucklugs which have been designed to gain the maximum advantages of the new Tri-Dent crimping action.

For additional data, circle item 231 on the handy coupon on page 76.

National adds features to plug-in strip line

SWITCH-CONTROLLED multi-outlet Plug-in Strip can now be mounted directly to outlet boxes with a new fitting recently introduced by the manufacturer, National Electric Products Corp., Gateway Center, Pittsburgh, Pa.

Designated as CF3-629, the new outlet box cover comes furnished with three splicing jumpers and insulator tubes ready for crimp-on connection to the Plug-in Strip.

It was developed for use as a cover plate on device and outlet box feed installations when using Type CF3 switch-controlled Plug-in Strip. The product is listed by Underwriters' Laboratories, Inc.

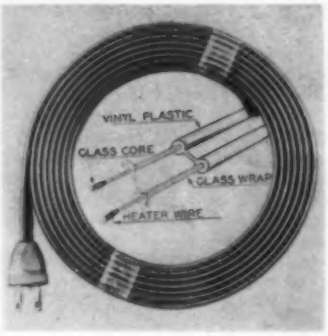
For additional data, circle item 232 on the handy coupon on page 76.

Smith-Gates develops low-cost lineal heater

A TOP-QUALITY, low-cost lineal heater called Line-O-Heat has been developed by the Smith-Gates Corp., Plainville, Conn., manufacturer of electrical equipment for farm, home and industry.

Designed and tested to afford maximum efficiency at lowest cost for years, Line-O-Heat prevents freeze-ups of water pipes, pumps, roof valleys, eaves and house gutters. It is ideal, too, for soil warming and for supplying additional heat in raising small animals.

Pliable enough to wrap around your finger, it can still take abuse and stay in use. It will keep water from freezing even when the temperature dips to 50 degrees below



zero, and is actually strong enough to use as an electric tow cable.

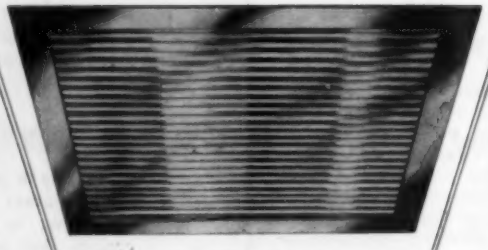
Line-O-Heat is of two types: tape and single strand loop, rated respectively at five watts and 2½ watts per foot, 120 volt ac. Tape is available in three, six, 12, 20, 40, and 60 foot lengths. Loop comes in six, 12 and 24 foot lengths.

Resistance wire is spiraled on an exceptionally strong glass core, over which is placed a double reverse wrapping of Fiberglas. This encased heating wire assembly is then covered with a high temperature vinyl plastic jacket, providing an excellent combination of moisture and low temperature flexibility.

Line-O-Heat is easy to use. Simply apply where needed and plug in.

For additional data, circle item 233 on the handy coupon on page 76.

AIR-FLO MODEL 610



AUTOMATIC CEILING SHUTTER

Outstanding Features of Model 610 Automatic Ceiling Shutter

- Neutral Aluminum Color Blends With Any Decoration and Color Scheme
- Flush Appearance
- One Continuous Panel Regardless of Width
- Maximum Free Air Opening
- Fusible Links Release Spring Action in Case of Fire
- Full Opening Feature Minimizes Fan Air Delivery Loss

*Southeastern Factory Warehouse 177 Harris St., N. W., Atlanta, Ga.

MANUFACTURED BY AIR CONDITIONING PRODUCTS COMPANY

2340 W. LAFAYETTE • DETROIT, MICHIGAN

Automation

(*Continued from page 29*)

tank falls below the lower probe, the level control closes the electrical circuit controlling the pump and the tank fills. When the liquid rises to the level of the upper probe, the fluid itself acts as a conductor of the current required for the operation of the level control. This opens the electrical circuit controlling the pump, and the pumping operation stops.

Electronic level controls are used today to handle practically all types of electrically conductive industrial chemicals. These include concentrated and diluted acids, bases, and salts; milk, beer, and tap water; alcohol, distilled water, penicillin, and refrigerants. The chemical processing industry has revealed a high degree of acceptance for electronic level control because it may be applied to installations requiring sanitary handling, installations requiring resistance to corrosion, and to installations involving the handling of highly viscous materials. Furthermore, electronic level controls have the unique characteristic of distinguishing betwen the liquid

STANDING POLE INSPECTION SERVICE

"Are your pines going at the top or bottom?" Write today.

OSMOSE WOOD PRESERVING CO., INC.
980 ELLICOTT ST., BUFFALO 9, N. Y.

LIGHTING FIXTURES

Sta-Brite Fluorescent Mfg. Co., P. O. Box 6352, Miami, Florida has added a complete line of contemporary lighting fixtures, Hi Hats, Bullets, recessed, etc. in addition to their extensive line of Fluorescent and Slimline Fixtures. Catalog on request.

and foam rising from the liquid. This is particularly important in the handling of milk since it is desirable to control the level of the liquid and not the milk foam.

Since electronic level controls require that only a small metal probe rod in the tank contact the liquid to be controlled, they are being applied to many automatic filling operations on such applications where the use of other types of level control would be impractical because of the limited space.

Built-in appliances

(*Continued from page 32*)

appear to be the answer to the electrical contractors' hopes and dreams. Now, these contractors can get into the appliance business through the "front door." They can sell as well as install these custom items and, unlike the appliance dealer, they will not have to depend upon others to handle the installation work which often means sacrifice of a portion of their profit.

With the continuing building boom in the South and Southwest, 1955 gives every indication of being one of the best ever for electrical contractors engaging in residential wiring work.

Electrified home

(*Continued from page 24*)

outside the house, too. The entire area around the house can be flooded with light at night. Through wide glass doors, one passes from the recreation room to the lawn which is equipped with an electrically controlled sprinkler system. Electrically activated, automatic garage doors make it unnecessary to get out of an automobile to open or close them.

A partial list of the electrical features of the Berman home follows:

1. 400-ampere service switch
2. Heat pump for heating and air conditioning
3. Quick recovery electric hot water heater
4. Electric washing machine
5. Electric dryer
6. Electric dishwasher
7. Electric dish towel dryer
8. Electrically-operated vertical louvers
9. Electrically operated vertical venetian blinds
10. All drapes open and close by electric motor
11. Windows open and close electrically
12. Electric stoves
13. Built-in electric ovens
14. Interior doors open and close electrically
15. Two television sets
16. Four radios
17. Hi-Fimaster set with speakers in all rooms
18. Inter-communication—it is possible for a person in any room to speak to a person in any other room or to answer the door
19. All blankets electric
20. Ten electric clocks
21. All electric lights in certain rooms controlled by dimmers
22. Low voltage switch system—293 lights can be turned on or off by the turn of a knob
23. Electric typewriter
24. Bathrooms can be heated independently from the other part of the house by ceiling heating coils
25. Jalousies that operate electrically
26. Electric air filter that extracts all dust and cigarette smoke from the air
27. Study and kitchen equipped with a luminous ceiling that is free from all shadows
28. TV antenna motor controlled
29. Electrocuting fly killer
30. Electrocuting lantern for control of night flying insects
31. Home freezer
32. Electric refrigerator
33. Glass panel heat for hobby-shop
34. Six electric exhaust fans
35. Electric mixer
36. Electric coffee maker

(*Continued on next page*)

Best Electrical Connection You'll Ever Make!

THERMO RAY®

Radiant Electric Wall Heaters

Installation couldn't be easier! Results couldn't be better! This electric wall heater is a natural for Southern distributors, dealers and contractors ... it's so well-suited to the needs of the South!

NEW, IMPROVED AND BETTER!

ThermoRay's new, exclusive construction imbeds heating elements INSIDE a non-breakable, non-shatterable Raybestos panel for safety; for quick and even heating.

Gives "Local Zone" heat control. Minimum initial inrush spells great ECONOMY.

THERE'S MORE TO THERMORAY!

Heat gentle and dependable, as soon as needed. A handsome unit, louvre-shielded for extra safety. At home in any room. Rugged construction, enduring finish, pull proof connections. No noise, no smoke, no soot, no fumes.

Many styles, for recessed or surface mounting, 750 and 1250 watts, 115 and 230 volts. Get the detailed descriptions. We welcome inquiries. Approved by Underwriters' Laboratories, Inc. Accepted by New York City Department of Water Supply, Gas and Electricity. Guaranteed for 5 years.

THERMORAY CORPORATION
South Buckhout St., Irvington-on-Hudson, N.Y.
Telephone: IRvington 9-7600

PLEASE USE THE COUPON

THERMORAY CORP.,
S. Buckhout St., Irvington-on-Hudson, N.Y.
Tell me about becoming a ThermoRay ☐ Distributor; ☐ Dealer; ☐ General information wanted.

NAME_____

FIRM_____

ADDRESS_____

K&H
UNIVERSAL PRESSURE TYPE
ADJUSTABLE LUGS

One or two bolt holes

Wire sizes Nos. 14 to 1,000,000 CM. One-piece construction — easily installed. Body is well proportioned to withstand excessive use, with ample thread area. Makes tenacious grip on stranded conductors, forcing contact with each wire in strand, thereby insuring utmost in conductivity — bottom of tongue surface is ground. Not susceptible to release under vibration.

Write for dimensions and prices

KRUEGER & HUDEPOHL, INC.
VINE AT THIRD E. S. CINCINNATI 7, OHIO

37. Electric vacuum cleaner
38. Electric toaster
39. 15,000 feet low voltage wire control circuits
40. Electric floor polisher
41. Electric knife sharpener
42. Electrically controlled lawn sprinkler system
43. Electric waffle iron
44. Electric sandwich grill
45. Electric garbage disposal
46. Electric blender
47. Six electric motors and electric tools in hobby shop
48. Electric dumb waiter
49. Electric razor
50. Electric dehumidifier

Clothing store lighting

(*Continued from page* 30)

Leon A. Haber, owner of the store, has reported an increase of 20 per cent in sales since the new installation. He states that employees and customers seem favorably impressed with the modernization.

Other favorable comment came from D. H. Hayes, electrical contractor, who executed the job. Mr. Hayes was highly pleased with the ease of installing the fluorescent fixtures and comments that the continuous rows of fixtures fitted perfectly into the openings of the acoustical tile ceiling, making such a neat appearance that there was no need of a finishing flange on the units.

Distribution substations

(*Continued from page* 41)

correctly, the time required to make them will be reduced if personnel do not have to familiarize themselves with each substation first. This will always mean manhour savings, but it becomes particularly important under emergency conditions when speed in restoring service is vital.

A fifth advantage of substation standardization is the neat appearance and compact design resulting from factory built standardized units, as compared with tailor-made field assembled substations. Being compact, a building block unit can often be located on a smaller site, thus reducing investment in real estate, and making it possible to build a substation on a small site near the load which otherwise could not be utilized. This neat appearance plus landscaping makes building block substations more acceptable in residential areas. This eliminates the necessity for locating conventional substations farther from the load or for erecting costly buildings around them, which in turn tends to economically justify smaller unit sizes.

Deferring system investment

One of the most important advantages of the building block philosophy is that investment in new facilities can be postponed until it is actually needed. System additions can be made to closely follow the load curve. This is usually a more economical approach than to build large substations in anticipation of future load growth.

On a dollar per kva basis, the smaller building block additions may cost more at the time of installation than a larger substation. But less capital will be standing around idle waiting for load to grow sufficiently to utilize it.

The economies which result from deferring system investment depend upon the comparative costs of the two methods of providing for load growth, and upon the elapsed time before installed capacity is fully utilized. The slower the load growth, and the more nearly equal the comparative investment costs on a dollar per kva basis, the more favorable the building block scheme will be.

Applying the block system

Four steps must be consciously or unconsciously followed to put the building block approach into practice. First, visualize the system as a whole, and not as a collection of small individual loads. In other words, adopt the system concept of power system planning, as opposed to the load concept.

Next classify and identify the general types of loads to be served, such as residential, rural, urban commercial, and industrial. Load classification is the basis for determining the standards of service which must be maintained, and as a result, the most appropriate substation types. For example, an average residential area would require entirely different standards of voltage control and service continuity than a typical large industrial customer. A different standard type of substation for each type of load would be the probable result. But on the other hand, two different areas, predominantly residential, but with features that keep them from being exactly alike could still be grouped

together, and would probably utilize the same type of blocks.

In general, classification should be made into areas having similar service continuity requirements. Division should be made into as few groups as possible.

Determination of standards

Once load classifications are identified, the next step is to determine standards of service for each load classification.

The quality of service that a utility renders to its customers can be measured in terms of two criteria: (1) the degree to which the system holds constant a predetermined voltage at the customer's terminals, and (2) the freedom from service interruptions.

No system can be designed on which consumer voltage will be held absolutely constant, and on which there will be absolute freedom from service interruption in all portions of the system. The degree to which perfection is approached is primarily an economic decision. In other words, how much is each degree of improvement worth? The answers will vary with the type and importance of the load.

For each load classification an allowable range of consumer voltages, on either side of nominal standard voltage, must be adopted for both normal and emergency operation. Each alternative scheme for serving the load must first fulfill these voltage standards by one means or another before they are compared economically. The "EEI-NEMA Preferred Voltage Ratings for A-C Systems and Equipment" is an excellent guide for determining these voltage standards.

Secondly, standards of allowable limits of outage time[2] must be determined — both for normal and for double contingency outages if the importance of the load demands it. The limits might be in minutes, or they might be in cycles if the nature and importance of the load demands such a high degree of continuity. Whatever the limits, there are many ways of improving continuity. The basis of comparison should again be economics — assuming that each method compared is in accordance with the adopted standards.

Once the standards of service have been determined, the final step in using the building block approach is in order — selection of the building blocks to be used. Selection of size and type of substation units will be made by economic comparison of those sizes and types that will provide the standards of service needed for each load classification. The factors affecting this selection are numerous, and will be taken up in detail in the next section.

The second part of this article will follow in the next issue.

[2] *"Service Continuity Standards Aid Planning and Operation," W. J. Lyman and V. E. Hill, Proceedings of the American Power Conference,* 1954.

Load dispatching center

(*Continued from page* 37)

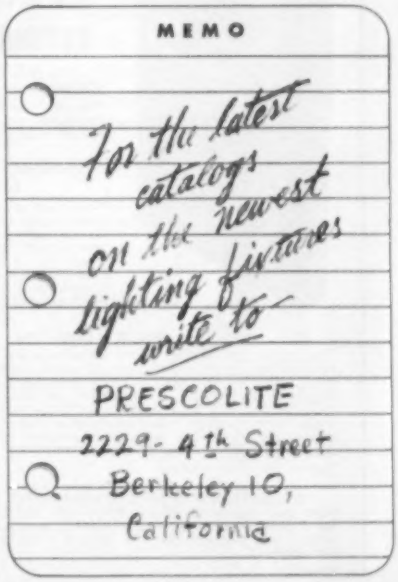
transmission system. The board is made of steel panel sections, welded together to form a semicircular wall on one side of the load dispatchers' room. Green paint finish is used as a background color; colored tape is used to designate lines and equipment. Also, colored magnets attached to the board indicate changes in load conditions. A glance at the board shows existing operating conditions.

To aid the load dispatchers in the control of the flow of power, meters indicate the flow of power in local circuits, and by means of telemetering, the amount of power flowing in the interconnection West of Cumberland is shown. This system, by means of a transmitter and receiver, gives an indication of the amount of power coming into company property from the west including the generating stations located at Albright and Lake Lynn.

Communication center

Because of its position as the load-dispatching center, Marlowe has become the focal point of all the Potomac Edison System's communications. From here, telephone lines radiate to all points on the company property. In addition, carrier current equipment is installed for relay operation. Some other substations are being arranged so that they can be operated remotely by supervisory control from Marlowe.

Marlowe Station is the eastern terminal for a microwave link to Ridgeley Substation. This new facility furnishes five channels for voice communication between Marlowe and Ridgeley (Cumberland). It also furnishes two telemetering channels to supply load



dispatchers with metering of the flow of power into the Potomac Edison Systems from the west.

Communication system

In the Hagerstown, Waynesboro and Martinsburg Districts, one microwave channel is used to control a communication transmitter located about 10 miles west of Hagerstown, Maryland. This transmitter is used in supervising Potomac Edison Line Department work in these districts by means of mobile units in Line Department vehicles. A similar transmitter located west of Cumberland is used for communicating with line trucks in the Cumberland and Frostburg Districts and is controlled by a microwave channel. The final channel of the microwave is reserved for test purposes. It is about 50 air miles from Marlowe to Cumberland, but because of the contour of the intervening land, it is necessary to use three repeater stations.

Marlowe Substation, now completed, is the most modern installation on the Potomac Edison System. Provisions have also been made at the substation for future conversion of present 69-kv transmission line to 132-kv, as indicated on the system map. The new substation has made it possible to improve system operation, thereby helping to supply electric power for an ever-growing load.

A-W conference

(*Continued from page* 34)

Luncheon at 12:30 P. M. Friday will be followed by an open forum on problems of local adequate wiring promotion, with E. R. Milby, assistant superintendent, customers' service division, Detroit Edison Company, as moderator. Mr. Milby is a member of the National Adequate Wiring Bureau Executive Committee.

Adjournment is scheduled for 4:00 P. M. on Friday.

New bank lighting

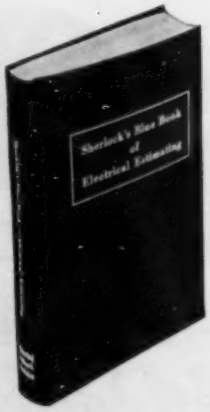
(*Continued from page* 19)

to a switchboard. To take care of all air conditioning and electrified office machinery as well as the lighting system, and with abundant reserve for future expansion, a double load has been provided. A combination of busduct and conduit was used. Future expansion of the bank and all its service facilities was carefully weighed, and the electric wiring was designed to take care of future needs without remodeling.

Added power load

The bank already absorbs a large electrical load. Present heavy power users include one elevator to the second floor and a fifteen-station pneumatic system for sending papers and messages throughout the bank. At present, the second floor is used mostly for storage, but electric wiring has been provided for heavy-power use in the future, when that second floor is converted to accommodate expanded facilities, and a third floor is added.

"We went all out to have the city's best-lighted building," says bank president, J. V. Satterfield, Jr. "We feel sure that we'll have extraordinary safety and a living advertisement functioning twenty-four hours a day, of the modern banking services and convenience to customer that we offer."



BRAND NEW—
QUICK ANSWER

ELECTRICAL ESTIMATING GUIDE

Covers Over 2000 Wiring Jobs

This new, entirely different estimating guide has 175 completely worked out charts.

Authentic, Time Saving—Easy to Use

This book is easy to use—it has no complicated mathematics or formulas to work over. You merely determine the nature of the wiring, check it in the BLUE BOOK OF ELECTRICAL ESTIMATING and there's your answer—it's the simplest estimating book ever written.

See It 5 Days Free

This book was written by a successful electrical contractor and estimating engineer with over 20 years' experience. It has an entirely different method of determining estimates on wiring jobs. Electrical contractors, journeymen, architects, and engineers will find use for this book every day. Gives time required to do jobs along with complete labor charges in every state in the country. Order this book now from your supplier at special introductory price of $7.75, or send coupon below.

Dealer inquiries invited.

ESTIMATING HANDBOOKS ASSOCIATES — DE KALB, ILL.
Send me the NEW BLUE BOOK OF ELECTRICAL ESTIMATING for 5 days free trial. I understand I may return the book within 5 days and owe nothing. If I keep it I will pay $7.75 plus postage for shipping.

NAME _____

ADDRESS _____

TOWN _____ **ZONE** _____ **STATE** _____

☐ **I enclose $7.75 to save shipping cost.**
☐ **Send C.O.D. I'll pay postman $7.75 plus C.O.D. fee on delivery.**

February ES-12

Cut Maintenance and Power Costs with

HINDLE DRY-TYPE TRANSFORMERS

The Modern Transformer for Modern Industry. 80° C. Rise — Class B Insulation. Available in size 25 VA to 200 KVA. One, two or three phase, 600 volts and below. A dependable product, manufactured according to the most advanced scientific methods and backed by 15 years experience in transformer design.

FREE Send for your free copy of our Dry Type catalog. It contains valuable information for the electrical engineer, consulting engineer, architect, contractor and buyer

HINDLE TRANSFORMER CO., INC.
10 WOODS CHURCH RD. FLEMINGTON, N.J.

HINDLE TRANSFORMER COMPANY INC

CONTOURED BRUSHES for

IMPROVED MOTOR PERFORMANCE
FEWER, FASTER BRUSH CHANGES
LESS MOTOR "DOWN" TIME

HELWIG CO. HELWIG SPEER CARBON PRODUCTS

2536 N. 30th St., Milw. 10, Wis.

Index of ADVERTISERS

A

A & A Supply Co. 59
Abolite Lighting Division, Jones Metals Product Co. ..... *
Accurate Mfg. Co. ..... *
Ackerman, J. H. ..... *
Adam Electric Co., Frank ..... *
Advance Transformer Co. ..... *
Air Conditioning Products Co. 78
Ajax Elec. Sales Co. 74
All-Steel Equipment, Inc. ..... *
Allis-Chalmers Mfg. Co. ..... Fourth Cover
Aluminum Co. of America ..... *
Amelia, J. Donald 62, 63
American Metal Molding Co. 66
American Steel & Wire Div., U. S. Steel Co. 14, 15
American Telephone & Telegraph Co. 6
Anderson Brass Works, Inc. ..... *
Anderson Co., C. B. 59
Anderson Co., Geo. E. 61
Arro Expansion Bolt Co. 67
Arrow-Hart & Hegeman Elec. Co. ..... *
Art Metal Company 8
Atlantic Conduit Fittings Co. 80
Atlantic Steel Co. ..... *

B

B & C Metal Stamping Co. 69
Bagby Co., S. L. ..... *
Bailey, Jr., T. H. 81
Beaven, W. H. 38, 74
Benjamin Electric Mfg. Co. ..... *
Benjamin Electric Mfg. Co., Leader Div. 55
Berko Elec. Mfg. Co. 72
Berns Manufacturing Co. 83
Berry Co., W. H. 74
Biglin Co., Inc., H. C. 78
Bissell, T. L. ..... *
Blackhawk Industries 76
Briegel Method Tool Co. 16
Broan Manufacturing Co. 70
Brock, Wm. 72
Brown, Clark E. ..... *
Bryant Electric Co. ..... *
Buffalo Forge Co. 71
Bulldog Elec. Products Co. 13
Bullivant, F. J. 82
Burndy Engineering Co. ..... *
Burrus & Matthews 35, 64, 69

C

Calverley, W. R. ..... *
Capy, Phil L. 28
Carol Cable Co., Div. of the Crescent Co., Inc. ..... *
Cason, William ..... Second Cover
Cavalier Corp. ..... *
Certified Equipment Mfgrs. (Ballasts) ..... *
Chapman & Co., Gary 68
Chelsea Fan & Blower Co. ..... *
Chick & Co., Louis P. 74
Circle F. Mfg. Co. ..... *
City Sales, Inc. 45
Clarkson, Ben ..... *
Classified Ads 79
Clower, Henry W. ..... *
Colcock, Hutson ..... *
Cole, J. H. 82
Columbia Cable & Electric Corp. ..... *
Conrad, C. H. 78
Cope, Inc., T. J. 62, 63
Copy, I. E., & Co. 62, 63
Cornish Wire Co. ..... *
Craig-Owen Co. 73
Crenshaw, Wm. 35
Crevasse, J. N. 45
Crockett-Lund Co. ..... *
Crouse-Hinds Co. 48
Curtis Lighting ..... *

D

Dawes, Edgar E. ..... *
Day-Brite Lighting, Inc. 45
Distribution Assemblies Department, General Electric Company ..... *
Dossert Mfg. Co. ..... *
Douty and Downie 57
Doxsee, Leigh A. 68
Drake, Arch 8
Drane, Becker 35
Dreyfuss, M. Jack ..... *
Duncan Electric Mfg. Co. 59
Dunlop & Dunlop ..... *

E

Eastern Fixtures Co. ..... *
Elder & Co., John W. 75
Electro Composand Company 73
Electromode Corp. 73
Elec. Eng. & Sales Co. ..... *
Elgo Shutter & Mfg. Co. ..... *
Engineer Sales Co. ..... *
Epperson, W. E. ..... *
Estimating Handbooks Associates 82
Everett Co., John T. 82

F

Fain & Levin ..... *
Fasco Industries, Inc. ..... *
Fay, G. H. ..... *
Federal Pacific Electric Co., Inc. ..... *
Felter Co., John 78
Ferguson, Lynn W. ..... Second Cover
Fielder Co., Tom 81
Fishburne, R. W. 69
Fleming & Co. 68
Forester Equip. Co. ..... *
Fullman Mfg. Co. 68
Furnas Electric Co. 77

G

G & W Elec. Specialty Co. ..... *
Gaines & Co., John G. ..... *
Gearhart, Walter V., Co. 59, 62, 63
Gedney Electric Co. ..... *
General Electric Co., Conduit Underfloor & Construction Materials Div. ..... *
General Electric Co. (Lamp Div.) ..... *
General Electric Co., Trumbull Components Department ..... *
General Electric Co., Wire & Cable—Construction Materials Div. ..... *
General Electric Co., Wire & Cable—Contractor Market ..... *
General Electric Co., Wiring Devices—Construction Materials Div. ..... *
General Electric Co., Distribution Transformers Department 10, 11
Gerstenberg, E. A. ..... *
Gibson Manufacturing Company 85
Gill, Allen G. 74
Glenn & Larson 62, 63
Glidden Eng. & Equip. Co. ..... *
Gold-Rick Equip. Co. 74
Graybar Electric Co. ..... *
Green, George ..... Second Cover
Gregory-Salisbury Co. 62, 63
Gulf Sales Agency 59
Guth Company, Edwin F. ..... *

H

Hagan, E. J. ..... *
Hagan, Jack 69, 73, 81
Hancock Co., John 81
Harris-Hanson Co. ..... *
Harrison Co., Tom ..... *
Helwig Company 82
Henderson, L. V. ..... *
Hill, Ken ..... *
Hindle Transformer Co. 82
Hinson, Walter M. 69
Hogan, Jr., Paul ..... Second Cover, 45
Hopper & McCoy 67, 80
Hover, Ernest 59
Howe & Co., W. F. ..... *
Hubbard & Co. ..... *
Hubbell, Inc., Harvey ..... *
Huemmer, Walter J. ..... *
Hunter Fan & Ventilating Co. ..... Front Cover

I

Ideal Industries, Inc. ..... *
I.T.E. Circuit Breaker Company ..... *

J

Jones, J. W. ..... *
Jones, Metal Products ..... *
Judge, Fred 76
Junghans, Herman J. ..... *

K

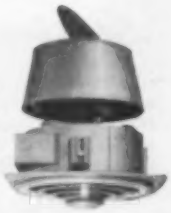
Kaiser Aluminum & Chemical Corp. 17
Kearney, James R., Corp. ..... *
Keener, Frank E. ..... *

"CF" SERIES Shallow, 3½" over-all depth, easy mounting in sidewall or ceiling. Aluminum, blower-type pressure blade. Available with 3 speed control and necessary installation fittings. Chrome or White Grill. In models delivering 400 and 525 CFM at end of duct. List prices from **$26.25**

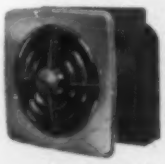
Actual, on-the-job records prove it takes only minutes, once the opening is made, to install any Berns Air King Built-In Ventilating Fan. Combine this man-hour savings with low initial cost and precision engineering that guarantees efficient, trouble-free performance . . . for a savings that's really worthwhile!

Your choice of 21 models with all these features:

- Center grill knob for easy grill removal
- Motor and blade mounted on 1 bracket—removable by loosening wing nuts
- Extra length "Break Off" Bolts to accommodate any wall or ceiling depth
- Exclusive packaging that does not require disassembly of inside or outside housing for installation.
- U.L. and C.S.A. Approval.



"TC" SERIES Low cost plus economical installation for single story homes. Installs through ceiling. Pressure type blade. 525 CFM or 750 CFM at fan discharge. Chrome or White Grill. Available with 3 Speed Control. List as low as..... **$21.60**



"WF" SERIES Outside hood incorporates shutter. Pressure-type blade. Wall switch controlled operation at a practical price. Available with 3 speed control. Chrome or White Grill. 475 CFM or 600 CFM at Fan Discharge. List price from **$27.55**

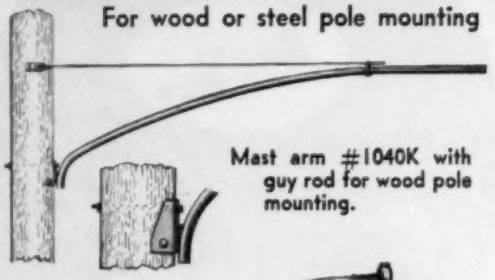
Write for Free Literature To:

BERNS MANUFACTURING CORP.
3050 North Rockwell Street, Chicago 18, Illinois

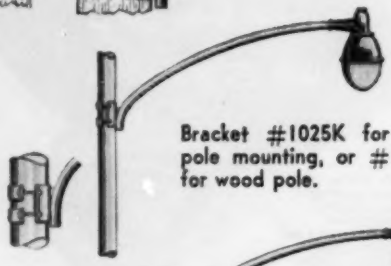
KERRIGAN Weldforged
Steel Brackets & Mast Arms

For Economy & Beauty

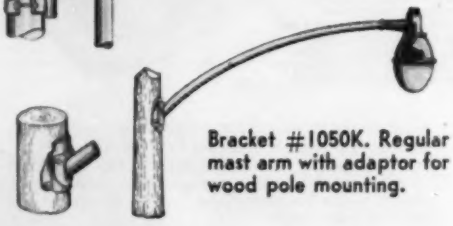
For wood or steel pole mounting



Mast arm #1040K with guy rod for wood pole mounting.



Bracket #1025K for steel pole mounting, or #1035K for wood pole.



Bracket #1050K. Regular mast arm with adaptor for wood pole mounting.

Kerrigan's complete line of brackets and mast arms are carefully engineered for easy installation and wiring. They meet all I.E.S. street lighting recommendations. So, take advantage of your wood poles now in place and brighten up your city or town NOW!

Let us help you

solve your city's lighting problems. Send for our FREE catalog containing engineering data. It shows how simple installation really is.

KERRIGAN IRON WORKS, INC.
Nashville, Tennessee
Gen'l. Sales Office — 274 Madison Ave. — N.Y.C.

Index of ADVERTISERS

Keller, W. J. *
Kennon, W. N. *
Kerrigan Iron Works, Inc. 84
Keystone Mfg. Co. *
Killark Elec. Co. 61
Koeln & Co., Geo. R. 75
Krueger & Hudepohl 80
Kuhlman Electric Co. *

L

Lamb & Co., A. V. 73
Landers Co., L. Morris *
Lassiter, W. H., Jr. 75, 81
Ledford, L. O. *
Leviton Mfg. Co. 31
Light & Power Utilities Corp. 2
Lint Co., Clyde W. *
Lloyd, Chester R. *
Lloyd Factory Sales Agents, J. A. *
Lombardi, E. F. *
Loyd, Inc., Ernest T. 61
Luesing, Wm. 83
Lumpkin, Paul 83

M

Macon, H. L. *
Massey, Inc., A. H. 73
Mayerson-Follman Co. 83
M & W Electric Mfg. Co., Inc. 74
Marcus Transformer Company, Inc. *
McCain, J. E. 82
McCourt, Leo T. 61
McCreary, B. L. 75
McNeill, B. E. 82
McPherson, F. C. 81
Meier Electric & Machine Co., Inc. *
Michler, P. A. *
Miller Company, The *
Milner, Gene W. 53
Milner & Co., W. J. 53
Mims & Assoc., Clyde E. *
Mitchell Manufacturing Co. *
Munding Elec. Sales Agency 45
Musgrove, Curtis *
Myrick, C. C., Jr. 66

N

Nash, Walter 16
Nelson, W. F. 35
Nichols, N. B. *
Norris Thermador Corp. *
North, J. Scoby 67
Noser, J. A. 81
Novelty Lighting Corp. *
Nuro Company *
Nutone, Inc. *

O

O Z Electrical Mfg. Co., Inc. *
Ong, Richard 57
Orangeburg Mfg. Co., Inc. *
Orlick, A. M. 31
Osmose Wood and Preserving Co. of America, Inc. 79

P

Paranite Wire & Cable Div., Essex Wire Corp. *
Pass & Seymour, Inc. 57
Peabody Brothers 9, 49, 66
Pendergraph Co., H. A. 83
Penn-Union Electric Corp. *
Peterson & Lowe 67
Phelps Dodge Copper Products Corp. 7
Picker, F. C. *
Plymouth Rubber Company, Inc. *
Porcelain Products, Inc. 47
Prag, Elmer *
Prescolite Mfg. Co. 81
Progress Manufacturing Co. 39
Pryne & Company, Inc. *
Pyle-National Co., The 73
Pyramid Instrument Corp. *

R

Ramond, Chas. K. *
Randall, Jim 57
Redmann, S. M. 75
Revere Electric Mfg. Co. *
Richey, E. B. Second Cover
Ridge Tool Company *
Ridgeway, J. T. 60
Roach, Leo A. *
Roberts Co., Bob *
Robertson, Inc., Elgin B. *
Robinson, C. E. Second Cover
Roes, H. A. 45
Rome Cable Corp. 49
Rose Equip. Co., W. L. *
Rose, Herb M. *
Rottman, O. H. *
Royal Electric Company *
Ruff & Cannon 45

S

Sangamo Electric Company *
Schisler, D. A. Second Cover
Sessoms, Perry 73
Shaw-Hardy Co. *
Sheehan & Assoc., J. D. *
Sherrill, Paul *
Simmer, F. H. 68
Simplex Wire & Cable Co. 38
Smithcraft Lighting Division *
Snoots, Wayne *
Sommerlath, Jr. & Assoc., E. G. 73
Southern Electric Corp. *
Southland Sales Agents 47
Southwest Sales Service *
Southwire Company 1
Spang-Chalfant Div., National Supply Co. *
Sperti Faraday, Inc. *
Square D Co. Third Cover
Sta-Brite Fluorescent Mfg. Co. 79
Steel City Electric Company *
Stockdale Co., S. C. 72
Stone, Carson 82
Strong, Carl 69
Sullivan, Jr., W. E. 64
Sunbeam Lighting Co. 33
Sylvania Electric Products, Inc. *

T

Tennessee Coal & Iron Div., U. S. Steel Company *
Thermoray Corporation 79
Thomas & Betts Co. 50, 51
Thompson, Walter E. *
Thorsell, Carl W. 81
Tindall, Norman E. Second Cover
Titherington, R. G. *
Tomic Sales & Engineering Co. *
Trade-Winds Motorfans, Inc. *
Trumbull Components Department, General Electric Co. *
Turner, Will 39

U

Union Insulating Company 64
United States Rubber Co. (Wire & Cable Div.) 4, 5
United States Steel Co., American Steel & Wire Div. 14, 15
United States Steel Export Company 14, 15
United States Steel, Tennessee Coal & Iron Div. 14, 15
USCO Power Equip. Co. *

V

Victor Insulators, Inc. *

W

Wadsworth Electric Mfg. Co., Inc. 81
Wakefield Brass Co., The F. W. Second Cover
Walsh & Co., J. J. *
Walter, F. P. Second Cover
Want Ads 79
Ward Co., Chas. L. 62, 63
Weilbacher & Co., Albert 74
Weingarten & Sons, B. 83
Wells, Gordon 45
Western Insulated Wire *
Whitman, Marshall L., Co. Second Cover, 9
Wheeler Reflector Co. 9
White, C. O. 82
Wildeman, Walter W. 84
Winkler, B. L. *
Wiremold Company, The *
Wood & Anderson *
Wood, Donald D. 8
Woodyard, Charles L. 76, 81

Y

Youngstown Sheet & Tube 33

Right off your Square D Distributor's shelf!

New QMB Saflex Distribution Panelboard

Exactly the Power Panelboard you want—when you want it. Your Square D Distributor stocks boxes, interiors and plug-in units which can be quickly assembled to meet virtually any specifications. Above, interior ready for easy mounting in box.

Plug-in Units are installed easily on tubular bus bars. The solid neutral can be changed in minutes. Here is flexibility that reduces "down time" and saves money.

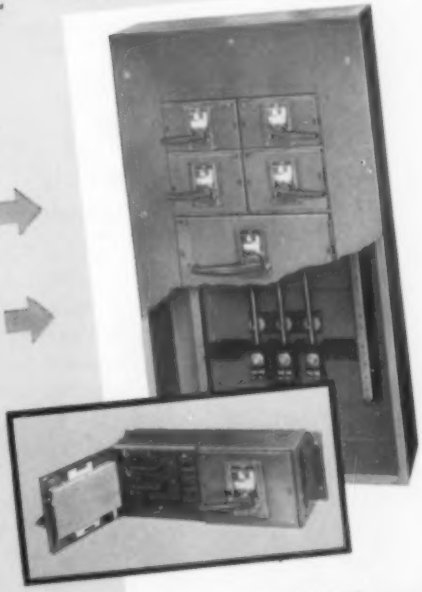
Three Simple Assembly Steps Fronts, with adjustable trim clamps, are available with or without doors.

With ALL these Quality Features

INTERIORS are flexible and adaptable to almost any service and voltage. Plug-in units and solid neutral can be changed simply and quickly.

BOXES provide generous wiring space.
FRONTS furnished with or without doors have adjustable trim clamps.

UNITS have quick-make, quick-break switch mechanism, visible blades and are horsepower rated. 30, 60, 100 and 200 ampere units are plug-in, while 400 and 600 ampere units are bolted to the bus.



•*Underwriters' Approved for Service Entrance*

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

What to Do When LOADS GROW

Use a Vault-Type Power Unit to Replace 3 or 4 Separate Distribution Transformers On Pole or Platform

New vault-type power unit saves space, is exceptionally easy to install, reduces maintenance.

It combines three or four distribution core and coil assemblies in a single tank. Unit is so compact that it requires less than half the space needed for a conventional bank of three or four distribution transformers. Put it anywhere: the tank is completely welded and the unit can be operated continuously in locations which may become flooded. Find a spot inside — as was done in the installation shown at right — you can locate it in any corner.

Factory Assembly Simplifies Installation

Units consist of either three or four distribution transformer core and coil assemblies to supply three-phase power or three-phase power and single-phase lighting loads. Metering connections are simplified by mounting current transformers in the case. Potential transformers can also be mounted internally if desired. Assemblies are internally connected at the factory and leads are terminated at the cover. There is no primary or secondary bus work to be done at the point of installation. If a three-assembly unit is desired for present needs, room can be left for a fourth assembly to be added at a later date when requirements increase.

A-4499

500-Kva, Three-Phase Vault-Type Power Unit

The Allis-Chalmers vault-type power unit is the ideal answer to space or load growth problems for schools, hospitals, hotels, large apartment houses, shopping centers — anywhere loads grow fast. Get complete information from your nearby A-C office or write Allis-Chalmers, Milwaukee 1, Wis., for all the facts.

ALLIS-CHALMERS